

WAC 296-62-14537 Appendix B-I through B-III—Respiratory questionnaire.

APPENDIX B-I
Respiratory Questionnaire

A. IDENTIFICATION DATA

PLANT _____ SOCIAL SECURITY NO. _____
DAY MONTH YEAR
(figures) (last 2 digits)

NAME _____ DATE OF INTERVIEW _____
(Surname)

(First Names) DATE OF BIRTH _____
M F

ADDRESS _____ AGE (8,9) SEX _____ (10)

RACE W N IND. OTHER _____ (11)

INTERVIEWER: 1 2 3 4 5 6 7 8 (12)

WORK SHIFT: 1st _____ 2nd _____ 3rd _____ (13) STANDING HEIGHT _____ (14,15)

PRESENT WORK AREA _____ WEIGHT _____ (16,18)

If working in more than one specified work area, X area where most of the work shift is spent. If "other," but spending 25% of the work shift in one of the specified work areas, classify in that work area. If carding department employee, check area within that department where most of the work shift is spent (if in doubt, check "throughout"). For work areas such as spinning and weaving where many work rooms may be involved, be sure to check the specific work room to which employee is assigned — if he works in more than one work room within a department classify as 7 (all) for that department.

	Workroom Number	(19) Open	(20) Pick	Area	(21) Card #1	(22) #2	(23) Spin	(24) Wind	(25) Twist	(26) Spool	(27) Warp	(28) Slshr	(29) Weave	(30) Other
AT RISK (cotton & cotton blend)	1			Cards										
	2			Draw										
	3			Comb										
	4			Rove										
	5			Thru Out										
	6													
	7 (all)													
Control (synthetic & wool)	8													
Ex-Worker (cotton)	9													

Use actual wording of each question. Put X in appropriate square after each question. When in doubt record 'No'. When no square, circle appropriate answer.

B. COUGH

(on getting up) †
Do you usually cough first thing in the morning? Yes No (31)
(Count a cough with first smoke or on "first going out of doors." Exclude clearing throat or a single cough.)

Do you usually cough during the day or at night? Yes No (32)
(Ignore an occasional cough.)

If 'Yes' to either question (31-32):

Do you cough like this on most days for as much as three months a year? Yes No (33)

Do you cough on any particular day of the week? Yes No (34)

(1) (2) (3) (4) (5) (6) (7)

If 'Yes': Which day? Mon. Tues. Wed.-Thurs. Fri. Sat. Sun. (35)

C. PHLEGM or alternative word to suit local custom.

(on getting up) †
Do you usually bring up any phlegm from your chest first thing in the morning? (Count phlegm with the first smoke or on "first going out of doors." Exclude phlegm from the nose. Count swallowed phlegm.) Yes No (36)

Do you usually bring up any phlegm from your chest during the day or at night? (Accept twice or more.) Yes No (37)

If 'Yes' to either question (36) or (37):

Do you bring up phlegm like this on most days for as much as three months each year? Yes No (38)

If 'Yes' to question (33) or (38):

(cough)
How long have you had this phlegm? (Write in number of years)
(1) [] 2 years or less
(2) [] More than 2 years-9 years
(3) [] 10-19 years
(4) [] 20+ years

†These words are for subjects who work at night

D. CHEST ILLNESSES

In the past three years, have you had a period of (increased) †cough and phlegm lasting for 3 weeks or more?
(1) [] No (40)
(2) [] Yes, only one period
(3) [] Yes, two or more periods

†For subjects who usually have phlegm

During the past 3 years have you had any chest illness which has kept you off work, indoors at home or in bed? (For as long as one week, †lu?) Yes No (41)

If 'Yes' to (41): Did you bring up (more) phlegm than usual in any of these illnesses? Yes No (42)

If 'Yes' to (42): During the past three years have you had: Only one such illness with increased phlegm? (1) [] (43)

More than one such illness: (2) [] (44)

Br. Grade _____

E. TIGHTNESS

Does your chest ever feel tight or your breathing become difficult? _____ Yes _____ No _____ (45)

Is your chest tight or your breathing difficult on any particular day of the week? (after a week or 10 days away from the mill) _____ Yes _____ No _____ (46)

If 'Yes': Which day? Mon. _____ Tues. _____ Wed. _____ Thur. _____ Fri. _____ Sat. _____ Sun. _____ (47)
 (1) Sometimes (2) Always

If 'Yes' Monday: At what time on Monday does your chest feel tight or your breathing difficult? 1 Before entering the mill _____ (48)
 2 After entering the mill _____

(Ask only if NO to Question (45)) _____

In the past, has your chest ever felt tight or your breathing difficult on any particular day of the week? _____ Yes _____ No _____ (49)

If 'Yes': Which day? Mon. _____ Tues. _____ Wed. _____ Thur. _____ Fri. _____ Sat. _____ Sun. _____ (50)
 (1) Sometimes (2) Always

F. BREATHLESSNESS

If disabled from walking by any condition other than heart or lung disease put "X" here and leave questions (52-60) unasked. _____ (51)

Are you ever troubled by shortness of breath, when hurrying on the level or walking up a slight hill? _____ Yes _____ No _____ (52)

If 'No', grade is 1. If 'Yes' proceed to next question

Do you get short of breath walking with other people at an ordinary pace on the level? _____ Yes _____ No _____ (53)

If 'No', grade is 2. If 'Yes', proceed to next question

Do you have to stop for breath when walking at your own pace on the level? _____ Yes _____ No _____ (54)

If 'No', grade is 3. If 'Yes', proceed to next question

Are you short of breath on washing or dressing? _____ Yes _____ No _____ (55)

If 'No', grade is 4. If 'Yes', grade is 5.

Dyspnea Grd. _____ (56)

ON MONDAYS:

Are you ever troubled by shortness of breath, when hurrying on the level or walking up a slight hill? _____ Yes _____ No _____ (57)

If 'No', grade is 1. If 'Yes', proceed to next question

Do you get short of breath walking with other people at an ordinary pace on the level? _____ Yes _____ No _____ (58)

If 'No', grade is 2. If 'Yes', proceed to next question

Do you have to stop for breath when walking at your own pace on the level? _____ Yes _____ No _____ (59)

If 'No', grade is 3. If 'Yes', proceed to next question

Are you short of breath on washing or dressing? _____ Yes _____ No _____ (60)

If 'No', grade is 4. If 'Yes', grade is 5

B. Grd. _____ (61)

G. OTHER ILLNESSES AND ALLERGY HISTORY

Do you have a heart condition for which you are under a doctor's care? Yes _____ No _____ (62)

Have you ever had asthma? Yes _____ No _____ (63)

If 'Yes', did it begin: (1) Before age 30
 (2) After age 30

If 'Yes' before 30: did you have asthma before ever going to work in a textile mill? Yes _____ No _____ (64)

Have you ever had hay fever or other allergies (other than above)? Yes _____ No _____ (65)

H. TOBACCO SMOKING*

Do you smoke?

Record 'Yes' if regular smoker up to one month ago. (Cigarettes, cigar or pipe) Yes _____ No _____ (66)

If 'No' to (66):

Have you ever smoked? (Cigarettes, cigars, pipe. Record 'No' if subject has never smoked as much as one cigarette a day, or 1 oz. of tobacco a month, for as long as one year.) Yes _____ No _____ (67)

If 'Yes' to (63) or (64); what have you smoked and for how many years? (Write in specific number of years in the appropriate square)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Years	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	>40	
Cigarettes										(68)
Pipe										(69)
Cigars										(70)

If cigarettes, how many packs per day? (Write in number of cigarettes) (1) less than 1/2 pack (71)
 (2) 1/2 pack, but less than 1 pack
 (3) 1 pack, but less than 1-1/2 packs
 (4) 1-1/2 packs or more

Number of pack years: _____ (72,73)

If an ex-smoker (cigarettes, cigar or pipe), how long since you stopped? _____ (74)
 (Write in number of years)

- (1) 0-1 year
- (2) 1-4 years
- (3) 5-9 years
- (4) 10+ years

*Have you changed your smoking habits since last interview? If yes, specify what changes.

I. OCCUPATIONAL HISTORY**

Have you ever worked in: A foundry? (As long as one year) Yes _____ No _____ (75)

Stone or mineral mining, quarrying or processing? (As long as one year) Yes _____ No _____ (76)

Asbestos milling or processing? (Ever) Yes _____ No _____ (77)

Other dusts, fumes or smoke? If yes, specify: Yes _____ No _____ (78)

Type of exposure _____

Length of exposure _____

**Ask only on first interview.

At what age did you first go to work in a textile mill? (Write in specific age in appropriate square).

(1)	(2)	(3)	(4)	(5)	(6)	
<20	20-24	25-29	30-34	35-39	40+	
						(79)

When you first worked in a textile mill, did you work with (1) Cotton or cotton blend (80)
 (2) Synthetic or wool

APPENDIX B-II
Respiratory Questionnaire for Nontextile Workers for the Cotton Industry

Identification No.

Interviewer Code

Location

Date of Interview

A. IDENTIFICATION

<p>1. NAME (Last) (First) (Middle Initial)</p>	<p>3. PHONE NUMBER AREA CODE () NO.</p>	<p>4. SOCIAL SECURITY # (optional see below)</p> <div style="border: 1px solid black; height: 15px; width: 100%;"></div>								
<p>2. CURRENT ADDRESS (Number, Street, or Rural Route, City or Town, County, State, Zip Code)</p>	<p>5. BIRTHDATE (Mo., Day, Yr.)</p>	<p>6. AGE LAST BIRTHDAY</p>								
	<p>7. SEX</p> <p style="text-align: center;">1 <input type="checkbox"/> Male 2 <input type="checkbox"/> Female</p>									
	<p>8. ETHNIC GROUP OR ANCESTRY</p> <p>1. <input type="checkbox"/> White, not of Hispanic Origin</p> <p>2. <input type="checkbox"/> Black, not of Hispanic Origin</p> <p>3. <input type="checkbox"/> Hispanic</p> <p>4. <input type="checkbox"/> American Indian or Alaskan Native</p> <p>5. <input type="checkbox"/> Asian or Pacific Islander</p> <p>6. <input type="checkbox"/> Other: _____</p>									
<p>9. STANDING HEIGHT _____ (cm)</p>	<p>10. WEIGHT _____</p>	<p>11. WORK SHIFT</p> <p style="text-align: center;">1st <input type="checkbox"/> 2nd <input type="checkbox"/> 3rd <input type="checkbox"/></p>								
<p>12. PRESENT WORK AREA</p> <p>Please indicate primary assigned work area and percent of time spent at that site. If at other locations, please indicate and note percent of time for each.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 5px;">PRIMARY WORK AREA</td> <td style="border-bottom: 1px solid black; height: 20px;"></td> </tr> <tr> <td style="border-bottom: 1px solid black; height: 20px;"></td> <td style="border-bottom: 1px solid black; height: 20px;"></td> </tr> <tr> <td style="padding: 5px;">SPECIFIC JOB</td> <td style="border-bottom: 1px solid black; height: 20px;"></td> </tr> <tr> <td style="border-bottom: 1px solid black; height: 20px;"></td> <td style="border-bottom: 1px solid black; height: 20px;"></td> </tr> </table>			PRIMARY WORK AREA				SPECIFIC JOB			
PRIMARY WORK AREA										
SPECIFIC JOB										
<p>13. APPROPRIATE INDUSTRY</p> <p>1 <input type="checkbox"/> Garnetting 3 <input type="checkbox"/> Cotton Warehouse 5 <input type="checkbox"/> Cotton Classification</p> <p>2 <input type="checkbox"/> Cottonseed Oil Mill 4 <input type="checkbox"/> Utilization 6 <input type="checkbox"/> Cotton Ginning</p>										
<p>(Furnishing your Social Security number is voluntary. Your refusal to provide this number will not affect any right, benefit, or privilege to which you would be entitled if you did provide your Social Security number. Your Social Security number is being requested since it will permit use in future determinations in statistical research studies.)</p>										

C. SYMPTOMS

Use actual wording of each question. Put X in appropriate square after each question. When in doubt record "No".

COUGH

1. Do you usually cough first thing in the morning?
(on getting up)* 1 Yes 2 No
(Count a cough with first smoke or on "first going out of doors". Exclude clearing throat or a single cough.)

2. Do you usually cough during the day or at night?
(Ignore an occasional cough.) 1 Yes 2 No

If YES to either question 1 or 2:

3. Do you cough like this on most days for as much as three months a year? 1 Yes 2 No 9 NA

4. Do you cough on any particular day of the week? 1 Yes 2 No

If YES:

5. Which day? Mon. Tue. Wed. Thur. Fri. Sat. Sun. _____

PHLEGM

6. Do you usually bring up any phlegm from your chest first thing in the morning? (on getting up)* 1 Yes 2 No
(Count phlegm with the first smoke or on "first going out of doors." Exclude phlegm from the nose. Count swallowed phlegm.)

7. Do you usually bring up any phlegm from your chest during the day or at night? 1 Yes 2 No
(Accept twice or more.)

If YES to either question 6 or 7:

8. Do you bring up phlegm like this on most days for as much as three months each year? 1 Yes 2 No

If YES to question 3 or 8:

9. How long have you had this phlegm? (cough) (1) 2 years or less
(Write in number of years) (2) More than 2 years - 9 years
(3) 10-19 years
(4) 20+ years

*These words are for subjects who work at night

CHEST ILLNESS

10. In the past three years, have you had a period of (increased) cough and phlegm lasting for 3 weeks or more?
- (1) No
 (2) Yes, only one period
 (3) Yes, two or more periods

For subjects who usually have phlegm:

11. During the past 3 years have you had any chest illness which has kept you off work, indoors at home or in bed? (For as long as one week, flu?)
- 1 Yes 2 No

If YES to 11:

12. Did you bring up (more) phlegm than usual in any of these illnesses?
- 1 Yes 2 No

If YES to 12: During the past three years have you had:

13. Only one such illness with increased phlegm? 1 Yes 2 No
14. More than one such illness: 1 Yes 2 No

Br. Grade _____

TIGHTNESS

15. Does your chest ever feel tight or your breathing become difficult? 1 Yes 2 No

16. Is your chest tight or your breathing difficult on any particular day of the week? (after a week or 10 days away from the mill) 1 Yes 2 No

17. If YES, Which day? Mon. (1) Sometimes (3) Tues. (2) Always (4) Wed. (5) Thur. (6) Fri. (7) Sat. (8) Sun.

18. If YES Monday: At what time on Monday does your chest feel tight or your breathing difficult? Before entering mill
 After entering mill

(ASK ONLY IF NO TO QUESTION 15)

19. In the past, has your chest ever been tight or your breathing difficult on any particular day of the week? 1 Yes 2 No

20. If YES, Which day? Mon. (1) Sometimes (3) Tues. (2) Always (4) Wed. (5) Thur. (6) Fri. (7) Sat. (8) Sun.

BREATHLESSNESS

21. If disabled from walking by any condition other than heart or lung disease put "X" in the space and leave questions (22-30) unasked.

22. Are you ever troubled by shortness of breath, when hurrying on the level or walking up a slight hill?

1 Yes 2 No

If NO, grade is 1. If YES, proceed to next question

23. Do you get short of breath walking with other people at an ordinary pace on the level?

1 Yes 2 No

If NO, grade is 2. If YES, proceed to next question

24. Do you have to stop for breath when walking at your own pace on the level?

1 Yes 2 No

If NO, grade is 3. If YES, proceed to next question

25. Are you short of breath on washing or dressing?

1 Yes 2 No

If NO, grade is 4. If YES, grade is 5.

26.

Dyspnea Grd. _____

ON MONDAYS:

27. Are you ever troubled by shortness of breath, when hurrying on the level or walking up a slight hill?

1 Yes 2 No

If NO, grade is 1. If YES, proceed to next question

28. Do you get short of breath walking with other people at an ordinary pace on the level?

1 Yes 2 No

If NO, grade is 2, If YES, proceed to next question

29. Do you have to stop for breath when walking at your own pace on the level?

1 Yes 2 No

If NO, grade is 3. If YES, proceed to next question

30. Are you short of breath on washing or dressing?

1 Yes 2 No

If NO, grade is 4. If YES, grade is 5

31.

B. Grd. _____

OTHER ILLNESSES AND ALLERGY HISTORY

32. Do you have a heart condition for which you are under a doctor's care?

1 Yes 2 No

OTHER ILLNESSES AND ALLERGY HISTORY CONTINUED:

33. Have you ever had asthma? 1 Yes 2 No
 If yes, did it begin: (1) Before age 30
 (2) After age 30
34. If yes before 30: did you have asthma before ever going to work in a textile mill? 1 Yes 2 No
35. Have you ever had hay fever or other allergies (other than above)? 1 Yes 2 No

TOBACCO SMOKING

36. Do you smoke? 1 Yes 2 No
 Record Yes if regular smoker up to one month ago. (Cigarettes, cigar or pipe)
- If NO to (33).
37. Have you ever smoked? (Cigarettes, cigars, pipe. Record NO if subject has never smoked as much as one cigarette a day, or 1 oz. of tobacco a month, for as long as one year.) 1 Yes 2 No

If Yes to (33) or (34); what have you smoked for how many years? (Write in specific number of years in the appropriate square)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Years...	(<5)	(5-9)	(10-14)	(15-19)	(20-24)	(25-29)	(30-34)	(35-39)	(>40)
38. Cigarettes									
39. Pipe									
40. Cigars									

41. If cigarettes, how many packs per day? Less than 1/2 pack
 Write in number of cigarettes 1/2 pack, but less than 1 pack
 _____ 1 pack, but less than 1 1/2 packs
 1-1/2 packs or more
42. Number of pack years: _____
43. If an ex-smoker (cigarettes, cigar or pipe), how long since you stopped? (Write in number of years.) _____
 0-1 year
 1-4 years
 5-9 years
 10+ years

OCCUPATIONAL HISTORY

Have you ever worked in:

- 44. A foundry? (As long as one year) 1 Yes 2 No
- 45. Stone or mineral mining, quarrying or
processing? (As long as one year) 1 Yes 2 No
- 46. Asbestos milling or processing? (Ever) 1 Yes 2 No
- 47. Cotton or cotton blend mill? (For controls only) 1 Yes 2 No
- 48. Other dusts, fumes or smoke? If yes, specify. 1 Yes 2 No

Type of exposure _____

Length of exposure _____

APPENDIX B III
Abbreviated Respiratory Questionnaire

A. IDENTIFICATION DATA

PLANT _____ SOCIAL SECURITY NO. _____ DAY MONTH YEAR
(figures) (last 2 digits)

NAME _____ DATE OF INTERVIEW _____
(Surname)

_____ DATE OF BIRTH _____
(First Name) M F

ADDRESS _____ AGE _____ (18,9) SEX _____ (10)

RACE W N IND OTHER _____ (11)

INTERVIEWER: 1 2 3 4 5 6 7 8 (12)

WORK SHIFT: 1st _____ 2nd _____ 3rd _____ (13) STANDING HEIGHT _____ (14,15)

PRESENT WORK AREA _____ WEIGHT _____ (16,18)

If working in more than one specified work area, X area where most of the work shift is spent. If "other," but spending 25% of the work shift in one of the specified work areas, classify in that work area. If carding department employee, check area within that department where most of the work shift is spent (if in doubt, check "throughout"). For work areas such as spinning and weaving where many work rooms may be involved, be sure to check the specific work room to which employee is assigned - if he works in more than one work room within a department classify as 7 (all) for that department.

	Workroom Number	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
		Open	Pick	Arms Card #1	#2	Spin	Wind	Twist	Spool	Warp	Slash	Weave	Other
AT RISK (cotton & cotton blend)	1			Cards									
	2			Draw									
	3			Comb									
	4			Rove									
	5			Thru Out									
	6												
	7 (all)												
Control (synthetic & wool)	8												
Ex-Worker (cotton)	9												

Use actual wording of each question. Put X in appropriate square after each question. When in doubt record 'No'. When no square, circle appropriate answer.

B. COUGH

(on getting up)†
Do you usually cough first thing in the morning? Yes No (31)
(Count a cough with first smoke or on "first going out of doors." Exclude clearing throat or a single cough.)

Do you usually cough during the day or at night? Yes No (32)
(Ignore an occasional cough.)

If 'Yes' to either question (31-32):

Do you cough like this on most days for as much as three months a year? Yes No (33)

Do you cough on any particular day of the week? Yes No (34)

(1) (2) (3) (4) (5) (6) (7)

If 'Yes': Which day? Mon. Tues. Wed. Thur. Fri. Sat. Sun. (35)

C. PHLEGM or alternative word to suit local custom.

(on getting up)†
Do you usually bring up any phlegm from your chest first thing in the morning? Yes No (36)
(Count phlegm with the first smoke or on "first going out of doors." Exclude phlegm from the nose. Count swallowed phlegm.)

Do you usually bring up any phlegm from your chest during the day or at night? Yes No (37)
(Accept twice or more.)

If 'Yes' to either question (36) or (37):

Do you bring up phlegm like this on most days for as much as three months each year? Yes No (38)

If 'Yes' to question (33) or (33):

How long have you had this (cough) phlegm? (Write in number of years)
(1) [] 2 years or less
(2) [] More than 2 years-9 years
(3) [] 10-19 years
(4) [] 20+ years

†These words are for subjects who work at night

D. TIGHTNESS

Does your chest ever feel tight or your breathing become difficult? Yes No (39)

Is your chest tight or your breathing difficult on any particular day of the week? (after a week or 10 days away from the mill) Yes No (40)

If 'Yes': Which day? Mon. Tues. Wed. Thur. Fri. Sat. Sun. (41)
(1) Sometimes (2) Always

If 'Yes' Monday: At what time on Monday does your chest feel tight or your breathing difficult?
1 [] Before entering the mill (42)
2 [] After entering the mill

(Ask only if NO to Question (45)*)

In the past, has your chest ever been tight or your breathing difficult on any particular day of the week? Yes No (43)

If 'Yes': Which day? Mon. Tues. Wed. Thur. Fri. Sat. Sun. (44)
(1) Sometimes (2) Always

E. TOBACCO SMOKING*

*Have you changed your smoking habits since last interview? If yes specify what changes.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-14537, filed 11/30/87.]

WAC 296-62-14539 Appendix C—Spirometry prediction tables for normal males and females.

TABLE 1. PREDICTED FVC FOR MALES (KHUDSON, ET AL.; AM REV RESPIR DIS. 1976. 113. 587.)

HT	AGE									
	17	19	21	23	25	27	29	31	33	35
60.0	3.44	3.59	3.75	3.91	3.72	3.66	3.61	3.55	3.49	3.43
60.5	3.50	3.66	3.81	3.97	3.80	3.75	3.69	3.63	3.57	3.51
61.0	3.56	3.72	3.88	4.03	3.89	3.83	3.77	3.71	3.66	3.60
61.5	3.63	3.79	3.94	4.10	3.97	3.91	3.85	3.80	3.74	3.68
62.0	3.69	3.85	4.00	4.16	4.05	3.99	3.94	3.88	3.82	3.76
62.5	3.76	3.91	4.07	4.22	4.13	4.08	4.02	3.96	3.90	3.84
63.0	3.82	3.97	4.13	4.29	4.22	4.16	4.10	4.04	3.99	3.93
63.5	3.88	4.04	4.19	4.35	4.30	4.24	4.18	4.13	4.07	4.01
64.0	3.95	4.10	4.26	4.41	4.30	4.27	4.21	4.15	4.09	4.03
64.5	4.01	4.17	4.32	4.48	4.45	4.41	4.35	4.29	4.23	4.17
65.0	4.07	4.23	4.39	4.54	4.55	4.49	4.43	4.37	4.32	4.26
65.5	4.14	4.29	4.45	4.60	4.63	4.57	4.51	4.46	4.40	4.34
66.0	4.20	4.36	4.51	4.67	4.71	4.65	4.60	4.54	4.48	4.42
66.5	4.26	4.42	4.58	4.73	4.80	4.74	4.68	4.62	4.56	4.51
67.0	4.33	4.48	4.64	4.80	4.88	4.82	4.76	4.70	4.65	4.59
67.5	4.39	4.55	4.70	4.86	4.96	4.90	4.84	4.79	4.73	4.67
68.0	4.45	4.61	4.77	4.92	5.04	4.98	4.93	4.87	4.81	4.75
68.5	4.52	4.67	4.83	4.99	5.13	5.07	5.01	4.95	4.89	4.84
69.0	4.58	4.74	4.89	5.05	5.21	5.15	5.09	5.03	4.98	4.92
69.5	4.64	4.80	4.96	5.11	5.29	5.23	5.17	5.12	5.06	5.00
70.0	4.71	4.86	5.02	5.18	5.37	5.32	5.26	5.20	5.14	5.08
70.5	4.77	4.93	5.08	5.24	5.46	5.40	5.34	5.28	5.22	5.17
71.0	4.83	4.99	5.15	5.30	5.54	5.48	5.42	5.36	5.31	5.25
71.5	4.90	5.05	5.21	5.37	5.62	5.56	5.50	5.45	5.39	5.33
72.0	4.96	5.12	5.27	5.43	5.70	5.65	5.59	5.53	5.47	5.41
72.5	5.03	5.18	5.34	5.49	5.79	5.73	5.67	5.61	5.55	5.50
73.0	5.09	5.24	5.40	5.56	5.87	5.81	5.75	5.69	5.64	5.58
73.5	5.15	5.31	5.46	5.62	5.95	5.89	5.83	5.78	5.72	5.66
74.0	5.22	5.37	5.53	5.68	6.03	5.98	5.92	5.86	5.80	5.74
74.5	5.28	5.44	5.59	5.75	6.12	6.06	6.00	5.94	5.88	5.83
75.0	5.34	5.50	5.65	5.81	6.20	6.14	6.08	6.02	5.97	5.91
75.5	5.41	5.56	5.72	5.87	6.28	6.22	6.17	6.11	6.05	5.99
76.0	5.47	5.63	5.78	5.94	6.36	6.31	6.25	6.19	6.13	6.07
76.5	5.53	5.69	5.85	6.00	6.45	6.39	6.33	6.27	6.21	6.16
77.0	5.60	5.75	5.91	6.06	6.53	6.47	6.41	6.35	6.29	6.24
77.5	5.66	5.82	5.97	6.13	6.61	6.55	6.50	6.44	6.38	6.32
78.0	5.72	5.88	6.04	6.19	6.69	6.64	6.58	6.52	6.46	6.40
78.5	5.79	5.94	6.10	6.26	6.70	6.72	6.66	6.60	6.54	6.49
79.0	5.85	6.01	6.16	6.32	6.86	6.88	6.82	6.76	6.70	6.64
79.5	5.91	6.07	6.23	6.38	6.94	6.88	6.83	6.77	6.71	6.65
80.0	5.98	6.13	6.29	6.45	7.02	6.97	6.91	6.85	6.79	6.73
80.5	6.04	6.20	6.35	6.51	7.11	7.05	6.99	6.93	6.87	6.82
81.0	6.10	6.26	6.42	6.57	7.19	7.13	7.07	7.02	6.96	6.90
81.5	6.17	6.32	6.48	6.64	7.27	7.21	7.16	7.10	7.04	6.98
82.0	6.23	6.39	6.54	6.70	7.35	7.30	7.24	7.18	7.12	7.06
82.5	6.30	6.45	6.61	6.76	7.44	7.38	7.32	7.26	7.20	7.15
83.0	6.36	6.51	6.67	6.83	7.52	7.46	7.40	7.35	7.29	7.23
83.5	6.42	6.58	6.73	6.89	7.60	7.54	7.49	7.43	7.37	7.31
84.0	6.49	6.64	6.80	6.95	7.68	7.63	7.57	7.51	7.45	7.39
84.5	6.55	6.71	6.86	7.02	7.77	7.71	7.65	7.59	7.53	7.47
85.0	6.61	6.77	6.92	7.08	7.85	7.79	7.73	7.67	7.62	7.56

TABLE 2. PREDICTED FEV1 FOR MALES (KHUDSON, ET AL: AM REV RESPIR DIS, 1976, 113, 567.)

HT	AGE																								
	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65
60.0	2.97	3.06	3.15	3.24	3.05	2.99	2.94	2.88	2.83	2.78	2.72	2.67	2.61	2.56	2.51	2.45	2.40	2.34	2.29	2.24	2.18	2.13	2.07	2.02	1.97
60.5	3.03	3.12	3.21	3.30	3.11	3.06	3.00	2.95	2.90	2.84	2.79	2.73	2.68	2.63	2.57	2.52	2.46	2.41	2.36	2.30	2.25	2.19	2.14	2.09	2.03
61.0	3.08	3.17	3.26	3.35	3.16	3.12	3.07	3.02	2.96	2.91	2.85	2.80	2.75	2.69	2.64	2.58	2.53	2.48	2.42	2.37	2.31	2.26	2.21	2.15	2.10
61.5	3.14	3.23	3.32	3.41	3.24	3.19	3.14	3.08	3.03	2.97	2.92	2.87	2.81	2.76	2.70	2.65	2.60	2.54	2.49	2.43	2.38	2.33	2.27	2.22	2.16
62.0	3.20	3.29	3.38	3.47	3.31	3.26	3.20	3.15	3.09	3.04	2.99	2.93	2.88	2.82	2.77	2.72	2.66	2.61	2.55	2.50	2.45	2.39	2.34	2.28	2.23
62.5	3.26	3.35	3.44	3.53	3.38	3.32	3.27	3.22	3.16	3.11	3.05	3.00	2.95	2.89	2.84	2.78	2.73	2.68	2.62	2.57	2.51	2.46	2.41	2.35	2.30
63.0	3.32	3.41	3.50	3.59	3.44	3.39	3.34	3.28	3.23	3.17	3.12	3.07	3.01	2.96	2.90	2.85	2.80	2.74	2.69	2.63	2.58	2.53	2.47	2.42	2.36
63.5	3.38	3.47	3.56	3.65	3.51	3.46	3.40	3.35	3.29	3.24	3.19	3.13	3.08	3.02	2.97	2.92	2.86	2.81	2.75	2.70	2.65	2.59	2.54	2.48	2.43
64.0	3.43	3.52	3.61	3.70	3.56	3.52	3.47	3.41	3.36	3.31	3.25	3.20	3.14	3.09	3.04	2.98	2.93	2.87	2.82	2.77	2.71	2.66	2.60	2.55	2.50
64.5	3.49	3.58	3.67	3.76	3.64	3.59	3.53	3.48	3.43	3.37	3.32	3.26	3.21	3.16	3.10	3.05	2.99	2.94	2.89	2.83	2.78	2.72	2.67	2.62	2.56
65.0	3.55	3.64	3.73	3.82	3.71	3.66	3.60	3.55	3.49	3.44	3.38	3.33	3.28	3.22	3.17	3.11	3.06	3.01	2.95	2.90	2.84	2.79	2.74	2.68	2.63
65.5	3.61	3.70	3.79	3.88	3.77	3.72	3.67	3.61	3.56	3.50	3.45	3.40	3.34	3.29	3.23	3.18	3.13	3.07	3.02	2.96	2.91	2.86	2.80	2.75	2.69
66.0	3.67	3.76	3.85	3.94	3.84	3.79	3.73	3.68	3.62	3.57	3.52	3.46	3.41	3.35	3.30	3.25	3.19	3.14	3.08	3.03	2.98	2.92	2.87	2.81	2.76
66.5	3.73	3.82	3.91	4.00	3.91	3.85	3.80	3.74	3.69	3.64	3.58	3.53	3.47	3.42	3.37	3.31	3.26	3.20	3.15	3.10	3.04	2.99	2.93	2.88	2.83
67.0	3.79	3.88	3.97	4.06	3.97	3.92	3.86	3.81	3.76	3.70	3.65	3.59	3.54	3.49	3.43	3.38	3.32	3.27	3.22	3.16	3.11	3.05	3.00	2.95	2.89
67.5	3.84	3.93	4.02	4.11	4.04	3.98	3.93	3.88	3.82	3.77	3.71	3.66	3.61	3.55	3.50	3.44	3.39	3.34	3.28	3.23	3.17	3.12	3.07	3.01	2.96
68.0	3.90	3.99	4.08	4.17	4.10	4.05	4.00	3.94	3.89	3.83	3.78	3.73	3.67	3.62	3.56	3.51	3.46	3.40	3.35	3.29	3.24	3.19	3.13	3.08	3.02
68.5	3.96	4.05	4.14	4.23	4.17	4.12	4.06	4.01	3.95	3.90	3.85	3.79	3.74	3.68	3.63	3.58	3.52	3.47	3.41	3.36	3.31	3.25	3.20	3.14	3.09
69.0	4.02	4.11	4.20	4.29	4.24	4.18	4.13	4.07	4.02	3.97	3.91	3.86	3.80	3.75	3.70	3.64	3.59	3.53	3.48	3.43	3.37	3.32	3.26	3.21	3.16
69.5	4.08	4.17	4.26	4.35	4.30	4.25	4.19	4.14	4.09	4.03	3.98	3.92	3.87	3.82	3.76	3.71	3.65	3.60	3.55	3.49	3.44	3.38	3.33	3.28	3.22
70.0	4.14	4.23	4.32	4.41	4.37	4.31	4.26	4.21	4.15	4.10	4.04	3.99	3.94	3.88	3.83	3.77	3.72	3.67	3.61	3.56	3.50	3.45	3.40	3.34	3.29
70.5	4.19	4.28	4.37	4.46	4.43	4.38	4.33	4.27	4.22	4.16	4.11	4.06	4.00	3.95	3.89	3.84	3.79	3.73	3.68	3.62	3.57	3.52	3.46	3.41	3.35
71.0	4.25	4.34	4.43	4.52	4.50	4.45	4.39	4.34	4.28	4.23	4.18	4.12	4.07	4.01	3.96	3.91	3.85	3.80	3.74	3.69	3.64	3.58	3.53	3.47	3.42
71.5	4.31	4.40	4.49	4.58	4.57	4.51	4.46	4.40	4.35	4.30	4.24	4.19	4.13	4.08	4.03	3.97	3.92	3.86	3.81	3.76	3.70	3.65	3.59	3.54	3.49
72.0	4.37	4.46	4.55	4.64	4.63	4.58	4.52	4.47	4.42	4.36	4.31	4.25	4.20	4.15	4.09	4.04	3.98	3.93	3.88	3.82	3.77	3.71	3.66	3.61	3.55
72.5	4.43	4.52	4.61	4.70	4.70	4.64	4.59	4.54	4.48	4.43	4.37	4.32	4.27	4.21	4.16	4.10	4.05	4.00	3.94	3.89	3.83	3.78	3.73	3.67	3.62
73.0	4.49	4.58	4.67	4.76	4.76	4.71	4.66	4.60	4.55	4.49	4.44	4.39	4.33	4.28	4.22	4.17	4.12	4.06	4.01	3.95	3.90	3.85	3.79	3.74	3.68
73.5	4.54	4.63	4.72	4.81	4.83	4.78	4.72	4.67	4.61	4.56	4.51	4.45	4.40	4.34	4.29	4.24	4.18	4.13	4.07	4.02	3.97	3.91	3.86	3.80	3.75
74.0	4.60	4.69	4.78	4.87	4.90	4.84	4.79	4.73	4.68	4.63	4.57	4.52	4.46	4.41	4.36	4.30	4.25	4.19	4.14	4.09	4.03	3.98	3.92	3.87	3.82
74.5	4.66	4.75	4.84	4.93	4.96	4.91	4.85	4.80	4.75	4.69	4.64	4.58	4.53	4.48	4.42	4.37	4.31	4.26	4.21	4.15	4.10	4.04	3.99	3.94	3.88
75.0	4.72	4.81	4.90	4.99	5.03	4.97	4.92	4.87	4.81	4.76	4.70	4.65	4.60	4.54	4.49	4.43	4.38	4.33	4.27	4.22	4.16	4.11	4.06	4.00	3.95
75.5	4.78	4.87	4.96	5.05	5.09	5.04	4.99	4.93	4.88	4.82	4.77	4.72	4.66	4.61	4.55	4.50	4.45	4.39	4.34	4.28	4.23	4.18	4.12	4.07	4.01
76.0	4.84	4.93	5.02	5.11	5.16	5.11	5.05	5.00	4.94	4.89	4.84	4.78	4.73	4.67	4.62	4.57	4.51	4.46	4.40	4.35	4.30	4.24	4.19	4.13	4.08
76.5	4.90	4.99	5.08	5.17	5.23	5.17	5.12	5.06	5.01	4.96	4.90	4.85	4.79	4.74	4.69	4.63	4.58	4.52	4.47	4.42	4.36	4.31	4.25	4.20	4.15
77.0	4.95	5.04	5.13	5.22	5.29	5.24	5.18	5.13	5.08	5.02	4.97	4.91	4.86	4.81	4.75	4.70	4.64	4.59	4.54	4.48	4.43	4.37	4.32	4.27	4.21
77.5	5.01	5.10	5.19	5.28	5.36	5.30	5.25	5.20	5.14	5.09	5.03	4.98	4.93	4.87	4.82	4.76	4.71	4.66	4.60	4.55	4.49	4.44	4.39	4.33	4.28
78.0	5.07	5.16	5.25	5.34	5.42	5.37	5.32	5.26	5.21	5.15	5.10	5.05	4.99	4.94	4.88	4.83	4.78	4.72	4.67	4.61	4.56	4.51	4.45	4.40	4.34
78.5	5.13	5.22	5.31	5.40	5.49	5.44	5.38	5.33	5.27	5.22	5.17	5.11	5.06	5.00	4.95	4.90	4.84	4.79	4.73	4.68	4.63	4.57	4.52	4.46	4.41
79.0	5.19	5.28	5.37	5.46	5.56	5.50	5.45	5.39	5.34	5.29	5.23	5.18	5.12	5.07	5.02	4.96	4.91	4.85	4.80	4.75	4.69	4.64	4.58	4.53	4.48
79.5	5.25	5.34	5.43	5.52	5.62	5.57	5.51	5.46	5.41	5.35	5.30	5.24	5.19	5.14	5.08	5.03	4.97	4.92	4.87	4.81	4.76	4.70	4.65	4.60	4.54
80.0	5.30	5.39	5.48	5.57	5.69	5.63	5.58	5.53	5.47	5.42	5.36	5.31	5.26	5.20	5.15	5.09	5.04	4.99	4.93	4.88	4.82	4.77	4.72	4.66	4.61
80.5	5.36	5.45	5.54	5.63	5.75	5.70	5.65	5.59	5.54	5.48	5.43	5.38	5.32	5.27	5.21	5.16	5.11	5.05	5.00	4.94	4.89	4.84	4.78	4.73	4.67
81.0	5.42	5.51	5.60	5.69	5.82	5.77	5.71	5.66	5.60	5.55	5.50	5.44	5.39	5.33	5.28	5.23	5.17	5.12	5.06	5.01	4.96	4.90	4.85	4.79	4.74
81.5	5.48	5.57	5.66	5.75	5.89	5.83	5.78	5.72	5.67	5.62	5.56	5.51	5.45	5.40	5.35	5.29	5.24	5.18	5.13	5.07	5.02	4.97	4.91	4.86	4.81
82.0	5.54	5.63	5.72	5.81	5.95	5.90	5.84	5.79	5.74	5.68	5.63	5.57	5.52	5.47	5.41	5.36	5.30	5.25	5.20	5.14	5.09	5.03	4.98	4.93	4.87
82.5	5.60	5.69	5.78	5.87	6.02	5.96	5.91	5.86	5.80	5.75	5.69	5.64	5.59	5.53	5.48	5.42	5.37	5.32	5.26	5.21	5.15	5.10	5.05	4.99	4.94
83.0	5.65	5.74	5.83	5.92	6.08	6.03	5.98	5.92	5.87	5.81	5.76	5.71	5.65	5.60	5.54	5.49	5.44	5.38	5.33	5.27	5.22	5.17	5.11	5.06	5.00
83.5	5.71	5.80	5.89	5.98	6.15	6.10	6.04	5.99	5.93	5.88	5.83	5.77	5.72	5.66	5.61	5.56	5.50	5.45	5.39	5.34	5.29	5.23	5.18	5.12	5.07
84.0	5.77	5.86	5.95	6.04	6.22	6.16	6.11	6.05	6.00	5.95	5.89	5.84	5.78	5.73	5.68	5.62	5.57	5.51	5.46	5.41	5.35	5.30	5.24	5.19	5.14
84.5	5.83	5.92	6.01	6.10	6.28	6.23	6.17	6.12	6.07	6.01	5.96	5.90	5.85	5.80	5.74	5.69	5.63	5.58	5.53	5.47	5.42	5.36	5.31	5.26	5.20

AGH

TABLE 3. PREDICTED FVC FOR FEMALES (HUDSON, ET AL.) AM RHY RESPIR DIS, 1976, 113, 507.)

HT	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65
52.0	2.45	2.64	2.65	2.61	2.56	2.52	2.47	2.43	2.39	2.34	2.30	2.25	2.21	2.17	2.12	2.00	2.03	1.99	1.95	1.90	1.86	1.81	1.77	1.73	1.68
52.5	2.50	2.68	2.70	2.65	2.61	2.57	2.52	2.48	2.43	2.39	2.35	2.30	2.26	2.21	2.17	2.13	2.08	2.04	1.99	1.95	1.91	1.86	1.82	1.77	1.73
53.0	2.54	2.72	2.74	2.70	2.66	2.61	2.57	2.52	2.48	2.44	2.39	2.35	2.30	2.26	2.22	2.17	2.13	2.08	2.04	2.00	1.95	1.91	1.86	1.82	1.78
53.5	2.50	2.76	2.79	2.75	2.70	2.66	2.62	2.57	2.53	2.48	2.44	2.40	2.35	2.31	2.26	2.22	2.18	2.13	2.09	2.04	2.00	1.96	1.91	1.87	1.82
54.0	2.62	2.81	2.84	2.79	2.75	2.71	2.66	2.62	2.57	2.53	2.49	2.44	2.40	2.35	2.31	2.27	2.22	2.18	2.13	2.09	2.05	2.00	1.96	1.91	1.87
54.5	2.66	2.85	2.89	2.84	2.80	2.75	2.71	2.67	2.62	2.58	2.53	2.49	2.45	2.40	2.36	2.31	2.27	2.23	2.18	2.14	2.09	2.05	2.01	1.96	1.92
55.0	2.71	2.89	2.93	2.89	2.84	2.80	2.76	2.71	2.67	2.62	2.58	2.54	2.49	2.45	2.40	2.36	2.32	2.27	2.23	2.18	2.14	2.10	2.05	2.01	1.96
55.5	2.75	2.93	2.98	2.94	2.89	2.85	2.80	2.76	2.72	2.67	2.63	2.58	2.54	2.50	2.45	2.41	2.36	2.32	2.28	2.23	2.19	2.14	2.10	2.06	2.01
56.0	2.79	2.97	3.03	2.98	2.94	2.89	2.85	2.81	2.76	2.72	2.67	2.63	2.59	2.54	2.50	2.45	2.41	2.37	2.32	2.28	2.23	2.19	2.15	2.10	2.06
56.5	2.83	3.01	3.07	3.03	2.99	2.94	2.90	2.85	2.81	2.77	2.72	2.68	2.63	2.59	2.55	2.50	2.46	2.41	2.37	2.33	2.28	2.24	2.19	2.15	2.11
57.0	2.87	3.06	3.12	3.08	3.03	2.99	2.94	2.90	2.86	2.81	2.77	2.72	2.68	2.64	2.59	2.55	2.50	2.46	2.42	2.37	2.33	2.28	2.24	2.20	2.15
57.5	2.91	3.10	3.17	3.12	3.08	3.04	2.99	2.95	2.90	2.86	2.82	2.77	2.73	2.68	2.64	2.60	2.55	2.51	2.46	2.42	2.38	2.33	2.29	2.24	2.20
58.0	2.96	3.14	3.21	3.17	3.13	3.08	3.04	2.99	2.95	2.91	2.86	2.82	2.77	2.73	2.69	2.64	2.60	2.55	2.51	2.47	2.42	2.38	2.33	2.29	2.25
58.5	3.00	3.18	3.26	3.22	3.17	3.13	3.09	3.04	3.00	2.95	2.91	2.87	2.82	2.78	2.73	2.69	2.65	2.60	2.56	2.51	2.47	2.42	2.38	2.33	2.29
59.0	3.04	3.22	3.31	3.26	3.22	3.18	3.13	3.09	3.04	3.00	2.96	2.91	2.87	2.82	2.78	2.74	2.69	2.65	2.60	2.56	2.52	2.47	2.43	2.38	2.34
59.5	3.08	3.27	3.36	3.31	3.27	3.22	3.18	3.14	3.09	3.05	3.00	2.96	2.92	2.87	2.83	2.78	2.74	2.70	2.65	2.61	2.56	2.52	2.48	2.43	2.39
60.0	3.12	3.31	3.40	3.36	3.31	3.27	3.23	3.18	3.14	3.09	3.05	3.01	2.96	2.92	2.87	2.83	2.79	2.74	2.70	2.65	2.61	2.57	2.52	2.48	2.43
60.5	3.17	3.35	3.45	3.41	3.36	3.32	3.27	3.23	3.19	3.14	3.10	3.05	3.01	2.97	2.92	2.88	2.83	2.79	2.75	2.70	2.66	2.61	2.57	2.53	2.49
61.0	3.21	3.39	3.50	3.45	3.41	3.36	3.32	3.28	3.23	3.19	3.14	3.10	3.06	3.01	2.97	2.92	2.88	2.84	2.79	2.75	2.70	2.66	2.62	2.57	2.53
61.5	3.25	3.43	3.54	3.50	3.46	3.41	3.37	3.32	3.28	3.24	3.19	3.15	3.10	3.06	3.02	2.97	2.93	2.88	2.84	2.80	2.75	2.71	2.66	2.62	2.58
62.0	3.29	3.48	3.59	3.55	3.50	3.46	3.41	3.37	3.33	3.28	3.24	3.19	3.15	3.11	3.06	3.02	2.97	2.93	2.89	2.84	2.80	2.75	2.71	2.67	2.62
62.5	3.33	3.52	3.64	3.59	3.55	3.51	3.46	3.42	3.37	3.33	3.29	3.24	3.20	3.15	3.11	3.07	3.02	2.98	2.93	2.89	2.85	2.80	2.76	2.71	2.67
63.0	3.38	3.56	3.68	3.64	3.60	3.55	3.51	3.46	3.42	3.38	3.33	3.29	3.24	3.20	3.16	3.11	3.07	3.02	2.98	2.94	2.89	2.85	2.80	2.76	2.72
63.5	3.42	3.60	3.73	3.69	3.64	3.60	3.56	3.51	3.47	3.42	3.38	3.34	3.29	3.25	3.20	3.16	3.12	3.07	3.03	2.98	2.94	2.90	2.85	2.81	2.76
64.0	3.46	3.64	3.78	3.73	3.69	3.65	3.60	3.56	3.51	3.47	3.43	3.38	3.34	3.29	3.25	3.21	3.16	3.12	3.07	3.03	2.99	2.94	2.90	2.85	2.81
64.5	3.50	3.69	3.83	3.78	3.74	3.69	3.65	3.61	3.56	3.52	3.47	3.43	3.39	3.34	3.30	3.25	3.21	3.17	3.12	3.08	3.03	2.99	2.95	2.90	2.86
65.0	3.54	3.73	3.87	3.83	3.78	3.74	3.70	3.65	3.61	3.56	3.52	3.48	3.43	3.39	3.34	3.30	3.26	3.21	3.17	3.12	3.08	3.04	2.99	2.95	2.90
65.5	3.59	3.77	3.92	3.88	3.83	3.79	3.74	3.70	3.66	3.61	3.57	3.52	3.48	3.44	3.39	3.35	3.30	3.26	3.22	3.17	3.13	3.08	3.04	3.00	2.95
66.0	3.63	3.81	3.97	3.92	3.88	3.83	3.79	3.75	3.70	3.66	3.61	3.57	3.53	3.48	3.44	3.39	3.35	3.31	3.26	3.22	3.17	3.13	3.09	3.04	3.00
66.5	3.67	3.85	4.01	3.97	3.93	3.88	3.84	3.79	3.75	3.71	3.66	3.62	3.57	3.53	3.49	3.44	3.40	3.35	3.31	3.27	3.22	3.18	3.13	3.09	3.05
67.0	3.71	3.89	4.06	4.02	3.97	3.93	3.88	3.84	3.80	3.75	3.71	3.66	3.62	3.58	3.53	3.49	3.44	3.40	3.36	3.31	3.27	3.22	3.18	3.14	3.09
67.5	3.75	3.94	4.11	4.06	4.02	3.98	3.93	3.89	3.84	3.80	3.76	3.71	3.67	3.62	3.58	3.54	3.49	3.45	3.40	3.36	3.32	3.27	3.23	3.18	3.14
68.0	3.79	3.98	4.15	4.11	4.07	4.02	3.98	3.93	3.89	3.85	3.80	3.76	3.71	3.67	3.63	3.58	3.54	3.49	3.45	3.41	3.36	3.32	3.27	3.23	3.19
68.5	3.84	4.02	4.20	4.16	4.11	4.07	4.03	3.98	3.94	3.89	3.85	3.81	3.76	3.72	3.67	3.63	3.59	3.54	3.50	3.45	3.41	3.37	3.32	3.28	3.23
69.0	3.88	4.06	4.25	4.20	4.16	4.12	4.07	4.03	3.98	3.94	3.90	3.85	3.81	3.76	3.72	3.68	3.63	3.59	3.54	3.50	3.46	3.41	3.37	3.32	3.28
69.5	3.92	4.10	4.30	4.25	4.21	4.16	4.12	4.08	4.03	3.99	3.94	3.90	3.86	3.81	3.77	3.72	3.68	3.64	3.59	3.55	3.50	3.46	3.42	3.37	3.33
70.0	3.96	4.15	4.34	4.30	4.25	4.21	4.17	4.12	4.08	4.03	3.99	3.95	3.90	3.86	3.81	3.77	3.73	3.68	3.64	3.59	3.55	3.51	3.46	3.42	3.37
70.5	4.00	4.19	4.39	4.35	4.30	4.26	4.21	4.17	4.13	4.08	4.04	3.99	3.95	3.91	3.86	3.82	3.77	3.73	3.69	3.64	3.60	3.55	3.51	3.47	3.42
71.0	4.05	4.23	4.44	4.39	4.35	4.30	4.26	4.22	4.17	4.13	4.08	4.04	4.00	3.95	3.91	3.86	3.82	3.78	3.73	3.69	3.64	3.60	3.56	3.51	3.47
71.5	4.09	4.27	4.48	4.44	4.40	4.35	4.31	4.26	4.22	4.18	4.13	4.09	4.04	4.00	3.96	3.91	3.87	3.82	3.78	3.74	3.69	3.65	3.60	3.56	3.52
72.0	4.13	4.31	4.53	4.49	4.44	4.40	4.35	4.31	4.27	4.22	4.18	4.13	4.09	4.05	4.00	3.96	3.91	3.87	3.83	3.78	3.74	3.69	3.65	3.61	3.56
72.5	4.17	4.36	4.58	4.53	4.49	4.45	4.40	4.36	4.31	4.27	4.23	4.18	4.14	4.09	4.05	4.01	3.96	3.92	3.87	3.83	3.79	3.74	3.70	3.65	3.61
73.0	4.21	4.40	4.62	4.58	4.54	4.49	4.45	4.40	4.36	4.32	4.27	4.23	4.18	4.14	4.10	4.05	4.01	3.96	3.92	3.88	3.83	3.79	3.74	3.70	3.66
73.5	4.26	4.44	4.67	4.63	4.58	4.54	4.50	4.45	4.41	4.36	4.32	4.28	4.23	4.19	4.14	4.10	4.06	4.01	3.97	3.92	3.88	3.84	3.79	3.75	3.70
74.0	4.30	4.48	4.72	4.67	4.63	4.59	4.54	4.50	4.45	4.41	4.37	4.32	4.28	4.23	4.19	4.15	4.10	4.06	4.01	3.97	3.93	3.88	3.84	3.79	3.75
74.5	4.34	4.52	4.77	4.72	4.68	4.63	4.59	4.55	4.50	4.46	4.41	4.37	4.33	4.28	4.24	4.19	4.15	4.11	4.06	4.02	3.97	3.93	3.89	3.84	3.80
75.0	4.38	4.57	4.81	4.77	4.72	4.68	4.64	4.59	4.55	4.50	4.46	4.42	4.37	4.33	4.28	4.24	4.20	4.15	4.11	4.06	4.02	3.98	3.93	3.89	3.84
75.5	4.42	4.61	4.86	4.82	4.77	4.73	4.68	4.64	4.60	4.55	4.51	4.46	4.42	4.38	4.33	4.29	4.24	4.20	4.16	4.11	4.07	4.02	3.98	3.94	3.89
76.0	4.47	4.65	4.91	4.86	4.82	4.77	4.73	4.69	4.64	4.60	4.55	4.51	4.47	4.42	4.38	4.33	4.29	4.25	4.20	4.16	4.11	4.07	4.03	3.98	3.94
76.5	4.51	4.69	4.95	4.91	4.87	4.82	4.78	4.73	4.69	4.65	4.60	4.56	4.51	4.47	4.43	4.38	4.34	4.29	4.25	4.21	4.16	4.12	4.07	4.03	3.99
77.0	4.55	4.73	5.00																						

TABLE 4. PREDICTED FEV1 FOR FEMALES (KHUDESOM, ET AL; AM REV RESPIR DIS. 1976. 113. 507.)

HT	AGE																								
	17	19	21	23	25	27	29	31	33	35															
52.0	2.31	2.40	2.33	2.29	2.25	2.21	2.16	2.12	2.00	2.04	2.00	1.95	1.91	1.87	1.83	1.79	1.74	1.70	1.66	1.62	1.58	1.53	1.49	1.45	1.41
52.5	2.34	2.51	2.37	2.32	2.28	2.24	2.20	2.16	2.11	2.07	2.03	1.99	1.95	1.90	1.86	1.82	1.78	1.74	1.69	1.65	1.61	1.57	1.53	1.48	1.44
53.0	2.38	2.55	2.40	2.36	2.32	2.27	2.23	2.19	2.15	2.11	2.06	2.02	1.98	1.94	1.90	1.85	1.81	1.77	1.73	1.69	1.64	1.60	1.56	1.52	1.48
53.5	2.41	2.58	2.43	2.39	2.35	2.31	2.27	2.22	2.18	2.14	2.10	2.06	2.01	1.97	1.93	1.89	1.85	1.80	1.76	1.72	1.68	1.64	1.59	1.55	1.51
54.0	2.45	2.62	2.47	2.43	2.38	2.34	2.30	2.26	2.22	2.17	2.13	2.09	2.05	2.01	1.96	1.92	1.88	1.84	1.80	1.75	1.71	1.67	1.63	1.59	1.54
54.5	2.48	2.65	2.50	2.46	2.42	2.38	2.33	2.29	2.25	2.21	2.17	2.12	2.08	2.04	2.00	1.96	1.91	1.87	1.83	1.79	1.75	1.70	1.66	1.62	1.58
55.0	2.51	2.68	2.54	2.49	2.45	2.41	2.37	2.33	2.28	2.24	2.20	2.16	2.12	2.07	2.03	1.99	1.95	1.91	1.86	1.82	1.78	1.74	1.70	1.65	1.61
55.5	2.55	2.72	2.57	2.53	2.49	2.45	2.40	2.36	2.32	2.28	2.24	2.19	2.15	2.11	2.07	2.03	1.98	1.94	1.90	1.86	1.82	1.77	1.73	1.69	1.65
56.0	2.58	2.75	2.61	2.56	2.52	2.48	2.44	2.40	2.35	2.31	2.27	2.23	2.19	2.14	2.10	2.06	2.02	1.98	1.93	1.89	1.85	1.81	1.77	1.72	1.68
56.5	2.62	2.79	2.64	2.60	2.56	2.51	2.47	2.43	2.39	2.35	2.30	2.26	2.22	2.18	2.14	2.09	2.05	2.01	1.97	1.93	1.88	1.84	1.80	1.76	1.72
57.0	2.65	2.82	2.67	2.63	2.59	2.55	2.51	2.46	2.42	2.38	2.34	2.30	2.25	2.21	2.17	2.13	2.09	2.04	2.00	1.96	1.92	1.88	1.83	1.79	1.75
57.5	2.69	2.86	2.71	2.67	2.62	2.58	2.54	2.50	2.46	2.41	2.37	2.33	2.29	2.25	2.20	2.16	2.12	2.08	2.04	1.99	1.95	1.91	1.87	1.83	1.78
58.0	2.72	2.89	2.74	2.70	2.66	2.62	2.57	2.53	2.49	2.45	2.41	2.36	2.32	2.28	2.24	2.20	2.15	2.11	2.07	2.03	1.99	1.94	1.90	1.86	1.82
58.5	2.75	2.92	2.78	2.73	2.69	2.65	2.61	2.57	2.52	2.48	2.44	2.40	2.36	2.31	2.27	2.23	2.19	2.15	2.10	2.06	2.02	1.98	1.94	1.89	1.85
59.0	2.79	2.96	2.81	2.77	2.73	2.69	2.64	2.60	2.56	2.52	2.48	2.43	2.39	2.35	2.31	2.27	2.22	2.18	2.14	2.10	2.06	2.01	1.97	1.93	1.89
59.5	2.82	2.99	2.85	2.80	2.76	2.72	2.68	2.64	2.59	2.55	2.51	2.47	2.43	2.38	2.34	2.30	2.26	2.22	2.17	2.13	2.09	2.05	2.01	1.96	1.92
60.0	2.86	3.03	2.88	2.84	2.80	2.75	2.71	2.67	2.63	2.59	2.54	2.50	2.46	2.42	2.38	2.33	2.29	2.25	2.21	2.17	2.12	2.08	2.04	2.00	1.96
60.5	2.89	3.06	2.91	2.87	2.83	2.79	2.75	2.70	2.66	2.62	2.58	2.54	2.49	2.45	2.41	2.37	2.33	2.28	2.24	2.20	2.16	2.12	2.07	2.03	1.99
61.0	2.93	3.10	2.95	2.91	2.86	2.82	2.78	2.74	2.70	2.65	2.61	2.57	2.53	2.49	2.44	2.40	2.36	2.32	2.28	2.23	2.19	2.15	2.11	2.07	2.02
61.5	2.96	3.13	2.90	2.94	2.90	2.86	2.81	2.77	2.73	2.69	2.65	2.60	2.56	2.52	2.48	2.44	2.39	2.35	2.31	2.27	2.23	2.18	2.14	2.10	2.06
62.0	2.99	3.16	3.02	2.97	2.93	2.89	2.85	2.81	2.76	2.72	2.68	2.64	2.60	2.55	2.51	2.47	2.43	2.39	2.34	2.30	2.26	2.22	2.18	2.13	2.09
62.5	3.03	3.20	3.05	3.01	2.97	2.93	2.88	2.84	2.80	2.76	2.72	2.67	2.63	2.59	2.55	2.51	2.46	2.42	2.38	2.34	2.30	2.25	2.21	2.17	2.13
63.0	3.06	3.23	3.09	3.04	3.00	2.96	2.92	2.88	2.83	2.79	2.75	2.71	2.67	2.62	2.58	2.54	2.50	2.46	2.41	2.37	2.33	2.29	2.25	2.20	2.16
63.5	3.10	3.27	3.12	3.08	3.04	2.99	2.95	2.91	2.87	2.83	2.78	2.74	2.70	2.66	2.62	2.57	2.53	2.49	2.45	2.41	2.36	2.32	2.28	2.24	2.20
64.0	3.13	3.30	3.15	3.11	3.07	3.03	2.99	2.94	2.90	2.86	2.82	2.78	2.73	2.69	2.65	2.61	2.57	2.52	2.48	2.44	2.40	2.36	2.31	2.27	2.23
64.5	3.17	3.34	3.19	3.15	3.10	3.06	3.02	2.98	2.94	2.89	2.85	2.81	2.77	2.73	2.68	2.64	2.60	2.56	2.52	2.47	2.43	2.39	2.35	2.31	2.26
65.0	3.20	3.37	3.22	3.18	3.14	3.10	3.05	3.01	2.97	2.93	2.89	2.84	2.80	2.76	2.72	2.68	2.63	2.59	2.55	2.51	2.47	2.42	2.38	2.34	2.30
65.5	3.23	3.40	3.26	3.21	3.17	3.13	3.09	3.05	3.00	2.96	2.92	2.88	2.84	2.79	2.75	2.71	2.67	2.63	2.58	2.54	2.50	2.46	2.42	2.37	2.33
66.0	3.27	3.44	3.29	3.25	3.21	3.17	3.12	3.08	3.04	3.00	2.96	2.91	2.87	2.83	2.79	2.75	2.70	2.66	2.62	2.58	2.54	2.49	2.45	2.41	2.37
66.5	3.30	3.47	3.33	3.28	3.24	3.20	3.16	3.12	3.07	3.03	2.99	2.95	2.91	2.86	2.82	2.78	2.74	2.70	2.65	2.61	2.57	2.53	2.49	2.44	2.40
67.0	3.34	3.51	3.36	3.32	3.28	3.23	3.19	3.15	3.11	3.07	3.02	2.98	2.94	2.90	2.86	2.81	2.77	2.73	2.69	2.65	2.60	2.56	2.52	2.48	2.44
67.5	3.37	3.54	3.39	3.35	3.31	3.27	3.23	3.18	3.14	3.10	3.06	3.02	2.97	2.93	2.89	2.85	2.81	2.76	2.72	2.68	2.64	2.60	2.55	2.51	2.47
68.0	3.41	3.58	3.43	3.39	3.34	3.30	3.26	3.22	3.18	3.13	3.09	3.05	3.01	2.97	2.92	2.88	2.84	2.80	2.76	2.71	2.67	2.63	2.59	2.55	2.50
68.5	3.44	3.61	3.46	3.42	3.38	3.34	3.29	3.25	3.21	3.17	3.13	3.08	3.04	3.00	2.96	2.92	2.87	2.83	2.79	2.75	2.71	2.66	2.62	2.58	2.54
69.0	3.47	3.64	3.50	3.46	3.41	3.37	3.33	3.29	3.25	3.20	3.16	3.12	3.08	3.04	2.99	2.95	2.91	2.87	2.83	2.78	2.74	2.70	2.66	2.62	2.57
69.5	3.51	3.68	3.53	3.49	3.45	3.41	3.36	3.32	3.28	3.24	3.20	3.15	3.11	3.07	3.03	2.99	2.94	2.90	2.86	2.82	2.78	2.73	2.69	2.65	2.61
70.0	3.54	3.71	3.57	3.52	3.48	3.44	3.40	3.36	3.31	3.27	3.23	3.19	3.15	3.10	3.06	3.02	2.98	2.94	2.89	2.85	2.81	2.77	2.73	2.68	2.64
70.5	3.56	3.75	3.60	3.56	3.52	3.47	3.43	3.39	3.35	3.31	3.26	3.22	3.18	3.14	3.10	3.05	3.01	2.97	2.93	2.89	2.84	2.80	2.76	2.72	2.68
71.0	3.61	3.78	3.63	3.59	3.55	3.51	3.47	3.42	3.38	3.34	3.30	3.26	3.21	3.17	3.13	3.09	3.05	3.00	2.96	2.92	2.88	2.84	2.79	2.75	2.71
71.5	3.65	3.82	3.67	3.63	3.59	3.54	3.50	3.46	3.42	3.37	3.33	3.29	3.25	3.21	3.16	3.12	3.08	3.04	3.00	2.95	2.91	2.87	2.83	2.79	2.74
72.0	3.68	3.85	3.70	3.66	3.62	3.58	3.53	3.49	3.45	3.41	3.37	3.32	3.28	3.24	3.20	3.16	3.11	3.07	3.03	2.99	2.95	2.90	2.86	2.82	2.78
72.5	3.71	3.88	3.74	3.70	3.65	3.61	3.57	3.53	3.49	3.44	3.40	3.36	3.32	3.28	3.23	3.19	3.15	3.11	3.07	3.02	2.98	2.94	2.90	2.86	2.81
73.0	3.75	3.92	3.77	3.73	3.69	3.65	3.60	3.56	3.52	3.48	3.44	3.39	3.35	3.31	3.27	3.23	3.18	3.14	3.10	3.06	3.02	2.97	2.93	2.89	2.85
73.5	3.78	3.95	3.81	3.76	3.72	3.68	3.64	3.60	3.55	3.51	3.47	3.43	3.39	3.34	3.30	3.26	3.22	3.18	3.13	3.09	3.05	3.01	2.97	2.92	2.88
74.0	3.82	3.99	3.84	3.80	3.76	3.71	3.67	3.63	3.59	3.55	3.50	3.46	3.42	3.38	3.34	3.29	3.25	3.21	3.17	3.13	3.08	3.04	3.00	2.96	2.92
74.5	3.85	4.02	3.87	3.83	3.79	3.75	3.71	3.66	3.62	3.58	3.54	3.50	3.45	3.41	3.37	3.33	3.29	3.24	3.20	3.16	3.12	3.08	3.03	2.99	2.95
75.0	3.89	4.06	3.91	3.87	3.82	3.78	3.74	3.70	3.66	3.61	3.57	3.53	3.49	3.45	3.40	3.36	3.32	3.28	3.24	3.19	3.15	3.11	3.07	3.03	2.98
75.5	3.92	4.09	3.94	3.90	3.86	3.82	3.77	3.73	3.69	3.65	3.61	3.56	3.52	3.48	3.44	3.40	3.35	3.31	3.27	3.23	3.19	3.14	3.10	3.06	3.02
76.0	3.95	4.12	3.90	3.94	3.89	3.85	3.81	3.77	3.73	3.69	3.64	3.60	3.56	3.52	3.47	3.43	3.39	3.35	3.31	3.26	3.22	3.18	3.14	3.10	3.05
76.5	3.99	4.16	4.01	3.97	3.93	3.89	3.84	3.80	3.76	3.72	3.68	3.63	3.59	3.55	3.51	3.47	3.42	3.38	3.34	3.30	3.26	3.21	3.17	3.13	3.09
77.0	4.02	4.19	4.05	4.00	3.96	3.92	3.88	3.84	3.79	3.75	3.71	3.67	3.63	3.59											

of the FEV₁ and FVC may be either directly or indirectly through volume and time base measurements. The volume calibration source should provide a volume displacement of at least 2 liters and should be accurate to within ± 30 milliliters.

(2) Technique for measurement of forced vital capacity maneuver.

(a) Use of a nose clip is recommended but not required. The procedures shall be explained in simple terms to the patient who shall be instructed to loosen any tight clothing and stand in front of the apparatus. The subject may sit, but care should be taken on repeat testing that same position be used and, if possible, the same spirometer. Particular attention shall be given to insure that the chin is slightly elevated with the neck slightly extended. The patient shall be instructed to make a full inspiration from a normal breathing pattern and then blow into the apparatus, without interruption, as hard, fast, and completely as possible. At least three forced expirations shall be carried out. During the maneuvers, the patient shall be observed for compliance with instructions. The expirations shall be checked visually for reproducibility from flow-volume or volume-time tracings or displays. The following efforts shall be judged unacceptable when the patient:

(i) Has not reached full inspiration preceding the forced expiration,

(ii) Has not used maximal effort during the entire forced expiration,

(iii) Has not continued the expiration for at least 5 seconds or until an obvious plateau in the volume time curve has occurred,

(iv) Has coughed or closed his glottis,

(v) Has an obstructed mouthpiece or a leak around the mouthpiece (obstruction due to tongue being placed in front of mouthpiece, false teeth falling in front of mouthpiece, etc.),

(vi) Has an unsatisfactory start of expiration, one characterized by excessive hesitation (or false starts), and therefore not allowing back extrapolation of time 0 (extrapolated volume on the volume time tracing must be less than 10 percent of the FVC),

(vii) Has an excessive variability between the three acceptable curves. The variation between the two largest FVC's and FEV₁'s of the three satisfactory tracings should not exceed 10 percent or ± 100 milliliters, whichever is greater.

(b) Periodic and routine recalibration of the instrument or method for recording FVC and FEV_{1.0} should be performed using a syringe or other volume source of at least 2 liters.

(3) Interpretation of spirogram.

(a) The first step in evaluating a spirogram should be to determine whether or not the patient has performed the test properly or as described in subsection (2) of this section. From the three satisfactory tracings, the forced vital capacity (FVC) and forced expiratory volume in 1 second (FEV_{1.0}) shall be measured and recorded. The largest observed FVC and largest observed FEV_{1.0} shall be used in the analysis regardless of the curve(s) on which they occur.

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(b) The following guidelines are recommended by NIOSH for the evaluation and management of workers exposed to cotton dust. It is important to note that employees who show reductions in FEV₁/FVC ratio below .75 or drops in Monday FEV₁ of 5 percent or greater on their initial screening exam, should be reevaluated within a month of the first exam. Those who show consistent decrease in lung function, as shown on the following table, should be managed as recommended.

(4) Qualifications of personnel administering the test.

Technicians who perform pulmonary function testing should have the basic knowledge required to produce meaningful results. Training consisting of approximately 16 hours of formal instruction should cover the following areas.

(a) Basic physiology of the forced vital capacity maneuver and the determinants of airflow limitation with emphasis on the relation to reproducibility of results.

(b) Instrumentation requirements including calibration procedures, sources of error and their correction.

(c) Performance of the testing including subject coaching, recognition of improperly performed maneuvers and corrective actions.

(d) Data quality with emphasis on reproducibility.

(e) Actual use of the equipment under supervised conditions.

(f) Measurement of tracings and calculations of results.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-14541, filed 7/6/88; 87-24-051 (Order 87-24), § 296-62-14541, filed 11/30/87.]

WAC 296-62-14543 Appendix E—Vertical elutriator equivalency protocol. (a) Samples to be taken—In order to ascertain equivalency, it is necessary to collect a total of 100 samples from at least 10 sites in a mill. That is, there should be 10 replicate readings at each of 10 sites. The sites should represent dust levels which vary over the allowable range of 0.5 to 2 times the permissible exposure limit. Each sample requires the use of two vertical elutriators (VE's) and at least one but not more than two alternative devices (AD's). Thus, the end result is 200 VE readings and either 100 or 200 AD readings. The 2 VE readings and the 1 or 2 AD readings at each time and site must be made simultaneously. That is, the two VE's and one or two AD's must be arranged together in such a way that they are measuring essentially the same dust levels.

(b) Data averaging—The two VE readings taken at each site are then averaged. These averages are to be used as the 100 VE readings. If two alternate devices were used, their test results are also averaged. Thus, after this step is accomplished, there will be 100 VE readings and 100 AD readings.

(c) Differences—For each of the 100 sets of measurements (VE and AD) the difference is obtained as the average VE reading minus the AD reading. Call these differences D_i. Thus, we have.

$$D_i = VE_i - AD_i, i = 1, 2, \dots, 100 \quad (1)$$

Next we compute the arithmetic mean and standard deviations of the differences, using equations (2) and (3), respectively.

$$\bar{X}_D = \frac{1}{N} \sum_{i=1}^N D_i \quad (2)$$

$$S_D = \sqrt{\frac{\sum_{i=1}^N D_i^2 - \frac{(\sum_{i=1}^N D_i)^2}{N}}{N-1}} \quad (3)$$

where N equals the number of differences (100 in this case), \bar{X}_D is the arithmetic mean and S_D is the standard deviation.

We next calculate the critical value as $T = K S_D \div |\bar{X}_D|$ where $K = 1.87$, based on 100 samples.

(d) Equivalency test. The next step is to obtain the average of the 100 VE readings. This is obtained by equation (4)

$$\bar{X}_{VE} = \frac{1}{N} \left(\sum_{i=1}^N VE_i \right) \quad (4)$$

We next multiply 0.25 by \bar{X}_{VE} . If $T < 0.25 \bar{X}_{VE}$, we can say that the alternate device has passed the equivalency test.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-16-009 (Order 86-28), § 296-62-14543, filed 7/25/86.]

PART O—COKE OVENS

WAC 296-62-200 Coke oven emissions. Scope and application. This section applies to the control of employee exposure to coke oven emissions.

[Order 77-14, § 296-62-200, filed 7/25/77.]

WAC 296-62-20001 Definitions. For the purpose of this section:

(1) "Authorized person." Any person specifically authorized by the employer whose duties require the person to enter a regulated area, or any person entering such an area as a designated representative of employees for the purpose of exercising the opportunity to observe monitoring and measuring procedures under WAC 296-62-20025.

(2) "Beehive oven." A coke oven in which the products of carbonization other than coke are not recovered, but are released into the ambient air.

(3) "Coke oven." A retort in which coke is produced by the destructive distillation or carbonization of coal.

(4) "Coke oven battery." A structure containing a number of slot-type coke ovens.

(5) "Coke oven emissions." The benzenesoluble fraction of total particulate matter present during the destructive distillation or carbonization of coal for the production of coke.

(6) "Director." The director of the department of labor and industries or his or her authorized representative.

(7) "Emergency." Any occurrence such as, but not limited to, equipment failure which is likely to, or does, result in any massive release of coke oven emissions.

(8) "Existing coke oven battery." A battery in operation or under construction on January 20, 1977, and which is not rehabilitated.

(9) "Rehabilitated coke oven battery." A battery which is rebuilt, overhauled, renovated, or restored such as from the pad up, after January 20, 1977.

[Title 296 WAC—p. 1728]

(10) "Stage charging." A procedure by which a predetermined volume of coal in each larry car hopper is introduced into an oven such that no more than two hoppers are discharging simultaneously.

(11) "Sequential charging." A procedure, usually automatically timed, by which a predetermined volume of coal in each larry car hopper is introduced into an oven such that no more than two hoppers commence or finish discharging simultaneously although, at some point, all hoppers are discharging simultaneously.

(12) "Pipeline charging." Any apparatus used to introduce coal into an oven which uses a pipe or duct permanently mounted onto an oven and through which coal is charged.

(13) "Green push." Coke which when removed from the oven results in emissions due to the presence of unvolatilized coal.

[Order 77-14, § 296-62-20001, filed 7/25/77.]

WAC 296-62-20003 Permissible exposure limit. The employer shall assure that no employee is exposed to coke oven emissions at concentrations greater than 150 micrograms per cubic meter of air (150 ug/m³), averaged over any 8-hour period.

[Order 77-14, § 296-62-20003, filed 7/25/77.]

WAC 296-62-20005 Regulated areas. (1) The employer shall establish regulated areas and shall limit access to them to authorized persons.

(2) The employer shall establish the following as regulated areas:

(a) The coke oven battery including topside and its machinery, pushside and its machinery, coke side and its machinery, and the battery ends; the wharf; and the screening station;

(b) The beehive oven and its machinery.

[Order 77-14, § 296-62-20005, filed 7/25/77.]

WAC 296-62-20007 Exposure monitoring and measurement. (1) Monitoring program.

(a) Each employer who has a place of employment where coke oven emissions are present shall monitor employees employed in the regulated area to measure their exposure to coke oven emissions.

(b) The employer shall obtain measurements which are representative of each employee's exposure to coke oven emissions over an eight-hour period. All measurements shall determine exposure without regard to the use of respiratory protection.

(c) The employer shall collect full-shift (for at least seven continuous hours) personal samples, including at least one sample during each shift for each battery and each job classification within the regulated areas including at least the following job classifications:

- (i) Lidman;
- (ii) Tar chaser;
- (iii) Larry car operator;
- (iv) Luteran;
- (v) Machine operator, coke side;
- (vi) Benchman, coke side;
- (vii) Benchman, pusher side;

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- (viii) Heater;
- (ix) Quenching car operator;
- (x) Pusher machine operator;
- (xi) Screening station operator;
- (xii) Wharfman;
- (xiii) Oven patcher;
- (xiv) Oven repairman;
- (xv) Spellman; and
- (xvi) Maintenance personnel.

(d) The employer shall repeat the monitoring and measurements required by subsection (1) of this section at least every three months.

(2) Redetermination. Whenever there has been a production, process, or control change which may result in new or additional exposure to coke oven emissions, or whenever the employer has any other reason to suspect an increase in employee exposure, the employer shall repeat the monitoring and measurements required by subsection (1) of this section for those employees affected by such change or increase.

(3) Employee notification.

(a) The employer shall notify each employee in writing of the exposure measurements which represent that employee's exposure within five working days after the receipt of the results of measurements required by subsection (1) and (2) of this section.

(b) Whenever such results indicate that the representative employee exposure exceeds the permissible exposure limit, the employer shall, in such notification, inform each employee of that fact and of the corrective action being taken to reduce exposure to or below the permissible exposure limit.

(4) Accuracy of measurement. The employer shall use a method of monitoring and measurement which has an accuracy (with a confidence level of 95%) of not less than plus or minus 35% for concentrations of coke oven emissions greater than or equal to 150 U_g/m³.

[Order 77-14, § 296-62-20007, filed 7/25/77.]

WAC 296-62-20009 Methods of compliance. The employer shall control employee exposure to coke oven emissions by the use of engineer controls, work practices and respiratory protection as follows:

(1) Priority of compliance methods.

(a) Existing coke oven batteries.

(i) The employer shall institute the engineer and work practice controls listed in subsections (2), (3) and (4) of this section in existing coke oven batteries at the earliest possible time, but not later than January 20, 1980, except to the extent that the employer can establish that such controls are not feasible. In determining the earliest possible time for institution of engineer and work practice controls, the requirement, effective August 27, 1971, to implement feasible administrative or engineer controls to reduce exposures to coal tar pitch volatiles, shall be considered. Wherever the engineer and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory

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protection which complies with the requirements of WAC 296-62-20011.

(ii) The engineer and work practice controls required under subsections (2), (3) and (4) of this section are minimum requirements generally applicable to all existing coke oven batteries. If, after implementing all controls required by subsections (2), (3) and (4) of this section, or after January 20, 1980, whichever is sooner, employee exposures still exceed the permissible exposure limit, employers shall implement any other engineer and work practice controls necessary to reduce exposure to or below the permissible exposure limit except to the extent that the employer can establish that such controls are not feasible. Whenever the engineer and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of WAC 296-62-20011.

(b) New or rehabilitated coke oven batteries.

(i) The employer shall institute the best available engineer and work practice controls on all new or rehabilitated coke oven batteries to reduce and maintain employee exposures at or below the permissible exposure limit, except to the extent that the employer can establish that such controls are not feasible. Wherever the engineer and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of WAC 296-62-20011.

(ii) If, after implementing all the engineer and work practice controls required by (b)(i) of this subsection, employee exposures still exceed the permissible exposure limit, the employer shall implement any other engineer and work practice controls necessary to reduce exposure to or below the permissible exposure limit except to the extent that the employer can establish that such controls are not feasible. Wherever the engineer and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of WAC 296-62-20011.

(c) Beehive ovens.

(i) The employer shall institute engineer and work practice controls on all beehive ovens at the earliest possible time to reduce and maintain employee exposures at or below the permissible exposure limit, except to the extent that the employer can establish that such controls are not feasible. In determining the earliest possible time for institution of engineer and work practice controls, the requirement, effective August 27, 1971, to implement feasible administrative or engineer controls to reduce exposures to coal tar pitch volatiles, shall be considered. Wherever the engineer and work practice controls which can be instituted are not sufficient to

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reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of WAC 296-62-20011.

(ii) If, after implementing all engineer and work practice controls required by (c)(i) of this subsection, employee exposures still exceed the permissible exposure limit, the employer shall implement any other engineer and work practice controls necessary to reduce exposures to or below the permissible exposure limit except to the extent that the employer can establish that such controls are not feasible. Whenever the engineer and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of WAC 296-62-20011.

(2) Engineer controls.

(a) Charging. The employer shall equip and operate existing coke oven batteries with all of the following engineer controls to control coke oven emissions during charging operations:

(i) One of the following methods of charging:

(A) Stage charging as described in subsection (3)(a)(ii) of this section; or

(B) Sequential charging as described in subsection (3)(a)(ii) of this section except that subsection (3)(a)(ii) and (3)(d) of this section does not apply to sequential charging; or

(C) Pipeline charging or other forms of enclosed charging in accordance with (a) of this subsection, except (a)(ii), (iv), (v), (vi) and (viii) of this subsection do not apply.

(ii) Drafting from two or more points in the oven being charged, through the use of double collector mains, or a fixed or moveable jumper pipe system to another oven, to effectively remove the gases from the oven to the collector mains;

(iii) Aspiration systems designed and operated to provide sufficient negative pressure and flow volume to effectively move the gases evolved during charging into the collector mains, including sufficient steam pressure, and steam jets of sufficient diameter;

(iv) Mechanical volumetric controls on each larry car hopper to provide the proper amount of coal to be charged through each charging hole so that the tunnel head will be sufficient to permit the gases to move from the oven into the collector mains;

(v) Devices to facilitate the rapid and continuous flow of coal into the oven being charged, such as stainless steel liners, coal vibrators or pneumatic shells;

(vi) Individually operated larry car drop sleeves and slide gates designed and maintained so that the gases are effectively removed from the oven into the collector mains;

(vii) Mechanized gooseneck and standpipe cleaners;

(viii) Air seals on the pusher machine leveler bars to control air infiltration during charging; and

(ix) Roof carbon cutters or a compressed air system or both on the pusher machine rams to remove roof carbon.

(b) Coking. The employer shall equip and operate existing coke oven batteries with all of the following engineer controls to control coke oven emissions during coking operations:

(i) A pressure control system on each battery to obtain uniform collector main pressure;

(ii) Ready access to door repair facilities capable of prompt and efficient repair of doors, door sealing edges and all door parts;

(iii) An adequate number of spare doors available for replacement purposes;

(iv) Chuck door gaskets to control chuck door emissions until such door is repaired, or replaced; and

(v) Heat shields on door machines.

(3) Work practice controls.

(a) Charging. The employer shall operate existing coke oven batteries with all of the following work practices to control coke oven emissions during the charging operation:

(i) Establishment and implementation of a detailed, written inspection and cleaning procedure for each battery consisting of at least the following elements:

(A) Prompt and effective repair or replacement of all engineer controls;

(B) Inspection and cleaning of goosenecks and standpipes prior to each charge to a specified minimum diameter sufficient to effectively move the evolved gases from the oven to the collector mains;

(C) Inspection for roof carbon build-up prior to each charge and removal of roof carbon as necessary to provide an adequate gas channel so that the gases are effectively moved from the oven into the collector mains;

(D) Inspection of the steam aspiration system prior to each charge so that sufficient pressure and volume is maintained to effectively move the gases from the oven to the collector mains;

(E) Inspection of steam nozzles and liquor sprays prior to each charge and cleaning as necessary so that the steam nozzles and liquor sprays are clean;

(F) Inspection of standpipe caps prior to each charge and cleaning and luting or both as necessary so that the gases are effectively moved from the oven to the collector mains; and

(G) Inspection of charging holes and lids for cracks, warpage and other defects prior to each charge and removal of carbon to prevent emissions, and application of luting material to standpipe and charging hole lids where necessary to obtain a proper seal.

(ii) Establishment and implementation of a detailed written charging procedure, designed and operated to eliminate emissions during charging for each battery, consisting of at least the following elements:

(A) Larry car hoppers filled with coal to a predetermined level in accordance with the mechanical volumetric controls required under subsection (2)(a)(iv) of this section so as to maintain a sufficient gas passage in the oven to be charged;

(B) The larry car aligned over the oven to be charged, so that the drop sleeves fit tightly over the charging holes; and

(C) The oven charged in accordance with the following sequence of requirements:

(I) The aspiration system turned on;

(II) Coal charged through the outermost hoppers, either individually or together, depending on the capacity of the aspiration system to collect the gases involved;

(III) The charging holes used under (a)(ii) and (b) of this subsection relidded or otherwise sealed off to prevent leakage of coke oven emissions;

(IV) If four hoppers are used, the third hopper discharged and relidded or otherwise sealed off to prevent leakage of coke oven emissions;

(V) The final hopper discharged until the gas channel at the top of the oven is blocked and then the chuck door opened and the coal leveled;

(VI) When the coal from the final hopper is discharged and the leveling operation complete, the charging hole relidded or otherwise sealed off to prevent leakage of coke oven emissions; and

(VII) The aspiration system turned off only after the charging holes have been closed.

(VIII) Establishment and implementation of a detailed written charging procedure, designed and operated to eliminate emissions during charging of each pipeline or enclosed charged battery.

(b) Coking. The employer shall operate existing coke oven batteries pursuant to a detailed written procedure established and implemented for the control of coke oven emissions during coking, consisting of at least the following elements:

(i) Checking oven back pressure controls to maintain uniform pressure conditions in the collecting main;

(ii) Repair, replacement and adjustment of oven doors and check doors and replacement of door jambs so as to provide a continuous metal-to-metal fit;

(iii) Cleaning of oven doors, chuck doors and door jambs each coking cycle so as to provide an effective seal;

(iv) An inspection system and corrective action program to control door emissions to the maximum extent possible; and

(v) Luting of doors that are sealed by luting each coking cycle and reluting, replacing or adjusting as necessary to control leakage.

(c) Pushing. The employer shall operate existing coke oven batteries with the following work practices to control coke oven emissions during pushing operations:

(i) Coke and coal spillage quenched as soon as practicable and not shoveled into a heated oven; and

(ii) A detailed written procedure for each battery established and implemented for the control of emissions during pushing consisting of the following elements:

(A) Dampering off the ovens and removal of charging hole lids to effectively control coke oven emissions during the push;

(B) Heating of the coal charge uniformly for a sufficient period so as to obtain proper coking including preventing green pushes;

(C) Prevention of green pushes to the maximum extent possible;

(D) Inspection, adjustment and correction of heating flue temperatures and defective flues at least weekly and after any green push, so as to prevent green pushes;

(E) Cleaning of heating flues and related equipment to prevent green pushes, at least weekly and after any green push.

(d) Maintenance and repair. The employer shall operate existing coke oven batteries pursuant to a detailed written procedure of maintenance and repair established and implemented for the effective control of coke oven emissions consisting of the following elements:

(i) Regular inspection of all controls, including goose-necks, standpipes, standpipe caps, charging hole lids and castings, jumper pipes and air seals for cracks, misalignment or other defects and prompt implementation of the necessary repairs as soon as possible;

(ii) Maintaining the regulated area in a neat, orderly condition free of coal and coke spillage and debris;

(iii) Regular inspection of the damper system, aspiration system and collector main for cracks or leakage, and prompt implementation of the necessary repairs;

(iv) Regular inspection of the heating system and prompt implementation of the necessary repairs;

(v) Prevention of miscellaneous fugitive topside emissions;

(vi) Regular inspection and patching of over brickwork;

(vii) Maintenance of battery equipment and controls in good working order;

(viii) Maintenance and repair of coke oven doors, chuck doors, door jambs and seals; and

(ix) Repairs instituted and completed as soon as possible, including temporary repair measures instituted and completed where necessary, including but not limited to:

(A) Prevention of miscellaneous fugitive topside emissions; and

(B) Chuck door gaskets, which shall be installed prior to the start of the next coking cycle.

(4) Filtered air.

(a) The employer shall provide positive-pressure, temperature controlled filtered air for larry car, pusher machine, door machine, and quench car cabs.

(b) The employer shall provide standby pulpits on the battery topside, at the wharf, and at the screening station, equipped with positive-pressure, temperature controlled filtered air.

(5) Emergencies. Whenever an emergency occurs, the next coking cycle may not begin until the cause of the emergency is determined and corrected, unless the employer can establish that it is necessary to initiate the next coking cycle in order to determine the cause of the emergency.

(6) Compliance program.

(a) Each employer shall establish and implement a written program to reduce exposures solely by means of the engineer and work practice controls specified in subsections (2) through (4) of this section.

(b) The written program shall include at least the following:

(i) A description of each coke oven operation by battery, including work force and operating crew, coking time, operating procedures and maintenance practices;

(ii) Engineer plans and other studies used to determine the controls for the coke battery;

(iii) A report of the technology considered in meeting the permissible exposure limit;

(iv) Monitoring data obtained in accordance with WAC 296-62-20007.

(v) A detailed schedule for the implementation of the engineer and work practice controls specified in subsections (2) through (4) of this section; and

(vi) Other relevant information.

(c) If, after implementing all controls required by subsections (2) through (4) of this section, or after January 20, 1980, whichever is sooner, or after completion of a new or rehabilitated battery the permissible exposure limit is still exceeded, the employer shall develop a detailed written program and schedule for the implementation of any additional engineer controls and work practices necessary to reduce exposure to or below the permissible exposure limit.

(d) Written plans for such programs shall be submitted, upon request, to the director, and shall be available at the worksite for examination and copying by the director, and the authorized employee representative. The plans required under this subsection shall be revised and updated at least every six months to reflect the current status of the program.

(7) Training in compliance procedures. The employer shall incorporate all written procedures and schedules required under this section in the education and training program required under WAC 296-62-20019 and, where appropriate, post in the regulated area.

[Statutory Authority: Chapter 49.17 RCW, 88-23-054 (Order 88-25), § 296-62-20009, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-16-009 (Order 86-28), § 296-62-20009, filed 7/25/86; Order 77-14, § 296-62-20009, filed 7/25/77.]

WAC 296-62-20011 Respiratory protection. (1) General.

(a) Where respiratory protection is required under this section, the employer shall provide and assure the use of respirators which comply with the requirements of this section. Compliance with the permissible limit exposure may not be achieved by the use of respirators except:

(i) During the time period necessary to install or implement feasible engineering and work practice controls; or

(ii) In work operations such as maintenance and repair activity in which engineering and work practice controls are technologically not feasible; or

(iii) In work situations where feasible engineering and work practice controls are not yet sufficient to reduce exposure to or below the permissible exposure limit; or

(iv) In emergencies.

(b) Notwithstanding any other requirement of this section, until January 20, 1978, the wearing of respirators shall be at the discretion of each employee where the employee is not in the vicinity of visible emissions.

(2) Selection.

(a) Where respirators are required under this section, the employer shall select, provide and assure the use of the appropriate respirator or combination of respirators from Table I below.

TABLE I
RESPIRATORY PROTECTION FOR COKE
OVEN EMISSIONS

Airborne concentration of coke oven emissions	Required respirator
(i) Any concentration.	<p>(A) A Type C supplied air respirator operated in pressure demand or other positive pressure or continuous flow mode; or</p> <p>(B) A powered air-purifying particulate filter respirator for dust, mist, and fume; or</p> <p>(C) A powered air-purifying particulate filter respirator combination chemical cartridge and particulate filter respirator for coke oven emissions.</p>
(ii) Concentrations not greater than 1500 $\mu\text{g}/\text{m}^3$.	<p>(A) Any particulate filter respirator for dust, mist and fume, except single-use respirator; or</p> <p>(B) Any particulate filter respirator or combination chemical cartridge and particulate filter respirator for coke oven emissions; or</p> <p>(C) Any respirator listed in subsection (2)(a)(i) of this section.</p>

(b) Not later than January 20, 1978, whenever respirators are required by this section for concentrations not greater than 1500 $\mu\text{g}/\text{m}^3$, the employer shall provide, at the option of each affected employee, either a particulate filter respirator as provided in subsection (2)(a)(ii) of this section, or a powered air purifying respirator as provided in subsection (2)(a)(i) of this section.

(c) The employer shall select respirators from among those approved for protection against dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11, except that not later than January 20, 1979, the employer shall select respirators from among those approved by NIOSH for protection against coke oven emissions.

(3) Respirator program. The employer shall institute a respiratory protection program in accordance with WAC 296-62-071.

(4) Respirator usage.

(a) The employer shall assure that the respirator issued to the employee exhibits minimum facepiece leakage and that the respirator is fitted properly.

(b) The employer shall allow each employee who uses a filter respirator to change the filter elements whenever an increase in breathing resistance is detected and shall maintain an adequate supply of filter elements for this purpose.

(c) The employer shall allow employees who wear respirators to wash their face and respirator facepiece to prevent skin irritation associated with respirator use.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 86-16-009 (Order 86-28), § 296-62-20011, filed 7/25/86. Statutory Authority: 49.17.040, 49.17.050, and 49.17.240, 81-16-015 (Order 81-20), § 296-62-20011, filed 7/27/81; Order 77-14, § 296-62-20011, filed 7/25/77.]

WAC 296-62-20013 Protective clothing and equipment. (1) Provision and Use. The employer shall provide and assure the use of appropriate protective clothing and equipment, such as but not limited to:

- (a) Flame resistant jacket and pants;
 - (b) Flame resistant gloves;
 - (c) Face shields or vented goggles which comply with WAC 296-24-078;
 - (d) Footwear providing insulation from hot surfaces;
 - (e) Safety shoes which comply with WAC 296-24-088;
- and
- (f) Protective helmets which comply with WAC 296-24-084.

(2) Cleaning and Replacement.

(a) The employer shall provide the protective clothing required by subsection (1)(a) and (b) of this section in a clean and dry condition at least weekly.

(b) The employer shall clean, launder, or dispose of protective clothing required by subsections (1)(a) and (b) of this section.

(c) The employer shall repair or replace the protective clothing and equipment as needed to maintain their effectiveness.

(d) The employer shall assure that all protective clothing is removed at the completion of a work shift only in change rooms prescribed in WAC 296-62-20015.

(e) The employer shall assure that contaminated protective clothing which is to be cleaned, laundered, or disposed of, is placed in a closed container in the changeroom.

(f) The employer shall inform any person who cleans or launders protective clothing required by this section, of the potentially harmful effects of exposure to coke oven emissions.

[Order 77-14, § 296-62-20013, filed 7/25/77.]

WAC 296-62-20015 Hygiene facilities and practices.

(1) Change rooms. The employer shall provide clean change rooms equipped with storage facilities for street clothes and separate storage facilities for protective clothing and equipment whenever employees are required to wear protective clothing and equipment in accordance with WAC 296-62-20013.

(2) Showers.

(a) The employer shall assure that employees working in the regulated area shower at the end of the work shift.

(b) The employer shall provide shower facilities in accordance with WAC 296-24-12009.

(3) Lunchrooms. The employer shall provide lunchroom facilities which have a temperature controlled, positive pressure, filtered air supply, and which are readily accessible to employees working in the regulated area.

(4) Lavatories.

(a) The employer shall assure that employees working in the regulated area wash their hands and face prior to eating.

(b) The employer shall provide lavatory facilities in accordance with WAC 296-24-12007.

(5) Prohibition of activities in the regulated area.

(a) The employer shall assure that in the regulated area, food or beverages are not present or consumed, smoking products are not present or used, and cosmetics are not

applied, except, that these activities may be conducted in the lunchrooms, change rooms and showers required under subsection (1)-(3) of this section.

(b) Drinking water may be consumed in the regulated area.

[Order 77-14, § 296-62-20015, filed 7/25/77.]

WAC 296-62-20017 Medical surveillance. (1) General requirements.

(a) Each employer shall institute a medical surveillance program for all employees who are employed in the regulated areas at least 30 days per year.

(b) This program shall provide each employee covered under subsection (1)(a) of this section with an opportunity for medical examinations in accordance with this section.

(c) The employer shall inform any employee who refuses any required medical examination of the possible health consequences of such refusal and shall obtain a signed statement from the employee indicating that the employee understands the risk involved in the refusal to be examined.

(d) The employer shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician, and are provided without cost to the employee.

(2) Initial examinations. At the time of initial assignment to a regulated area or upon the institution of the medical surveillance program, the employer shall provide a medical examination including at least the following elements:

(a) A work history and medical history which shall include smoking history and the presence and degree of respiratory symptoms, such as breathlessness, cough, sputum production, and wheezing;

(b) A 14" x 17" posterior-anterior chest x-ray and International Labour Office UICC/Cincinnati (ILO U/C) rating;

(c) Pulmonary function tests including forced vital capacity (FVC) and forced expiratory volume at one second (FEV 1.0) with recording of type of equipment used;

(d) Weight;

(e) A skin examination;

(f) Urinalysis for sugar, albumin, and hematuria; and

(g) A urinary cytology examination.

(3) Periodic examinations.

(a) The employer shall provide the examinations specified in subsections (2)(a)-(f) of this section at least annually for employees covered under subsection (1)(a) of this section.

(b) The employer shall provide the examinations specified in subsection (2)(a) and (c)-(g) of this section at least semi-annually for employees 45 years of age or older or with five or more years employment in the regulated area.

(c) Whenever an employee who is 45 years of age or older or with five or more years employment in the regulated area transfers or is transferred from employment in a regulated area, the employer shall continue to provide the examinations specified in subsections (2)(a) and (c)-(g) of this section semi-annually, as long as that employee is employed by the same employer or a successor employer.

(d) Whenever an employee has not taken the examination specified in subsections (3)(a)-(c) of this section within the six months preceding the termination of employment, the

employer shall provide such examinations to the employee upon termination of employment.

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

(a) A copy of this regulation and its Appendixes;

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

(c) The employee's exposure level or anticipated exposure level;

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

(e) Information from previous medical examinations of the affected employee which is not readily available to the examining physician.

(5) Physician's written opinion.

(a) The employer shall obtain a written opinion from the examining physician which shall include:

(i) The results of the medical examinations;

(ii) The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from exposure to coke oven emissions;

(iii) Any recommended limitations upon the employee's exposure to coke oven emissions or upon the use of protective clothing or equipment such as respirators; and

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

(b) The employer shall instruct the physician not to reveal in the written opinion specific findings or diagnoses unrelated to occupational exposure.

(c) The employer shall provide a copy of the written opinion to the affected employee.

[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 98-02-030, § 296-62-20017, filed 12/31/97, effective 1/31/98; Order 77-14, § 296-62-20017, filed 7/25/77.]

WAC 296-62-20019 Employee information and training. (1) Training program.

(a) The employer shall institute a training program for employees who are employed in the regulated area and shall assure their participation.

(b) The training program shall be provided as of January 20, 1977, for employees who are employed in the regulated area at that time or at the time of initial assignment to a regulated area.

(c) The training program shall be provided at least annually for all employees who are employed in the regulated area, except that training regarding the occupational safety and health hazards associated with exposure to coke oven emissions and the purpose, proper use, and limitations of respiratory protective devices shall be provided at least quarterly until January 20, 1978.

(d) The training program shall include informing each employee of:

(i) The information contained in the substance information sheet for coke oven emissions (Appendix A);

(ii) The purpose, proper use, and limitations of respiratory protective devices required in accordance with WAC 296-62-20011.

(iii) The purpose for and a description of the medical surveillance program required by WAC 296-62-20017 including information on the occupational safety and health hazards associated with exposure to coke oven emissions;

(iv) A review of all written procedures and schedules required under WAC 296-62-20009; and

(v) A review of this standard.

(2) Access to training materials.

(a) The employer shall make a copy of this standard and its appendixes readily available to all employees who are employed in the regulated area.

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

[Order 77-14, § 296-62-20019, filed 7/25/77.]

WAC 296-62-20021 Precautionary signs and labels.

(1) General.

(a) The employer may use labels or signs required by other statutes, regulations or ordinances in addition to, or in combination with, signs and labels required by this section.

(b) The employer shall assure that no statement appears on or near any sign required by this section which contradicts or detracts from the effects of the required sign.

(c) The employer shall assure that signs required by this section are illuminated and cleaned as necessary so that the legend is readily visible.

(2) Signs.

(a) The employer shall post signs in the regulated area bearing the legends:

DANGER

CANCER HAZARD

AUTHORIZED PERSONNEL ONLY

NO SMOKING OR EATING

(b) In addition, not later than January 20, 1978, the employer shall post signs in the areas where the permissible exposure limit is exceeded bearing the legend:

RESPIRATOR REQUIRED

(3) Labels. The employer shall apply precautionary labels to all containers of protective clothing contaminated with coke oven emissions. The label shall bear the following legend:

CAUTION

CLOTHING CONTAMINATED WITH COKE

EMISSIONS

DO NOT REMOVE DUST BY BLOWING OR SHAKING

[Order 77-14, § 296-62-20021, filed 7/25/77.]

WAC 296-62-20023 Recordkeeping. (1) Exposure measurements. The employer shall establish and maintain an accurate record of all measurements taken to monitor

employee exposure to coke oven emissions required in WAC 296-62-20007.

(a) This record shall include:

- (i) Name, social security number, and job classification of the employees monitored;
- (ii) The date(s), number, duration and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure where applicable;
- (iii) The type of respiratory protective devices worn, if any;
- (iv) A description of the sampling and analytical methods used and evidence of their accuracy; and
- (v) The environment variables that could affect the measurement of employee exposure.

(b) The employer shall maintain this record for at least 40 years or for the duration of employment plus 20 years, whichever is longer.

(2) Medical surveillance. The employer shall establish and maintain an accurate record for each employee subject to medical surveillance as required by WAC 296-62-20017.

(a) The record shall include:

- (i) The name, social security number, and description of duties of the employee;
- (ii) A copy of the physician's written opinion;
- (iii) The signed statement of any refusal to take a medical examination under WAC 296-62-20017; and
- (iv) Any employee medical complaints related to exposure to coke oven emissions.

(b) The employer shall keep, or assure that the examining physician keeps, the following medical records:

- (i) A copy of the medical examination results including medical and work history required under WAC 296-62-20017;
- (ii) A description of the laboratory procedures used and a copy of any standards or guidelines used to interpret the test results;
- (iii) The initial x-ray;
- (iv) The x-rays for the most recent 5 years;
- (v) Any x-ray with a demonstrated abnormality and all subsequent x-rays;
- (vi) The initial cytologic examination slide and written description;
- (vii) The cytologic examination slide and written description for the most recent 10 years; and
- (viii) Any cytologic examination slides with demonstrated atypia, if such atypia persists for 3 years, and all subsequent slides and written descriptions.

(c) The employer shall maintain medical records required under subsection (2) of this section for at least 40 years, or for the duration of employment plus 20 years, whichever is longer.

(3) Availability.

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

(b) Employee exposure measurement records and employee medical records required by this subsection shall be provided upon request to employees, designated representatives, and the assistant director in accordance with WAC

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296-62-05201 through 296-62-05209 and 296-62-05213 through 296-62-05217.

(c) The employer shall make available upon request employee medical records required to be maintained by subsection (2) of this section to a physician designated by the affected employee or former employee.

(4) Transfer of records.

(a) Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by this section.

(b) Whenever the employer ceases to do business and there is no successor employer to receive and retain the records for the prescribed period, these records shall be transmitted by registered mail to the director.

(c) At the expiration of the retention period for the records required to be maintained under subsections (1) and (2) of this section, the employer shall transmit these records by registered mail to the director or shall continue to retain such records.

(d) The employer shall also comply with any additional requirements involving transfer of records set forth in WAC 296-62-05215.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-62-20023, filed 8/27/81; Order 77-14, § 296-62-20023, filed 7/25/77.]

WAC 296-62-20025 Observation of monitoring. (1) Employee observation. The employer shall provide affected employees or their representatives an opportunity to observe any measuring or monitoring of employee exposure to coke oven emissions conducted pursuant to WAC 296-62-20007.

(2) Observation procedures.

(a) Whenever observation of the measuring or monitoring of employee exposure to coke oven emissions requires entry into an area where the use of protective clothing or equipment is required, the employer shall provide the observer with and assure the use of such equipment and shall require the observer to comply with all other applicable safety and health procedures.

(b) Without interfering with the measurement, observers shall be entitled to:

- (i) An explanation of the measurement procedures;
- (ii) Observe all steps related to the measurement of coke oven emissions performed at the place of exposure; and
- (iii) Record the results obtained.

[Order 77-14, § 296-62-20025, filed 7/25/77.]

WAC 296-62-20027 Appendix A—Coke oven emissions substance information sheet.

APPENDIX A

COKE OVEN EMISSIONS SUBSTANCE INFORMATION SHEET

I. SUBSTANCE IDENTIFICATION

- (1) Substance: Coke oven emissions
- (2) Definition: The benzene-soluble fraction of total particulate matter present during the destructive distillation or carbonization of coal for the production of coke.

[Title 296 WAC—p. 1735]

- (3) Permissible exposure limit: 150 micrograms per cubic meter of air determined as an average over an 8-hour period.
- (4) Regulated areas: Only employees authorized by your employer should enter a regulated area. The employer is required to designate the following areas as regulated areas: the coke oven battery, including topside and its machinery, pushside and its machinery, and the screening station; and the wharf, the beehive ovens and machinery.

II. HEALTH HAZARD DATA

Exposure to coke oven emissions is a cause of lung cancer, and possibly kidney cancer, in humans. Although it does not have an excess number of skin cancer cases in humans, repeated skin contact with coke oven emissions should be avoided.

III. PROTECTIVE CLOTHING AND EQUIPMENT

- (1) Respirators: Respirators will be provided by your employer for routine use if your employer is in the process of implementing engineering and work practice controls or where engineering and work practice controls are not feasible or insufficient. You must wear respirators for nonroutine activities or in emergency situations where you are likely to be exposed to levels of coke oven emissions in excess of the permissible exposure limit. Until January 20, 1978, the routine wearing of respirators is voluntary. Until that date, if you choose not to wear a respirator you do not have to do so. You must still have your respirator with you and you must still wear it if you are near visible emissions. Since how well your respirator fits your face is very important, your employer is required to conduct fit tests to make sure the respirator seals properly when you wear it. These tests are simple and rapid and will be explained to you during your training sessions.
- (2) Protective clothing: Your employer is required to provide, and you must wear, appropriate, clean, protective clothing and equipment to protect your body from repeated skin contact with coke oven emissions and from the heat generated during the coking process. This clothing should include such items as jacket and pants and flame resistant gloves. Protective equipment should include face shield or vented goggles, protective helmets and safety shoes, insulated from hot surfaces where appropriate.

IV. HYGIENE FACILITIES AND PRACTICES

You must not eat, drink, smoke, chew gum or tobacco, or apply cosmetics in the regulated area, except that drinking water is permitted. Your employer is required to provide lunchrooms and other areas for these purposes.

Your employer is required to provide showers, washing facilities, and change rooms. If you work in a regulated area, you must wash your face, and hands before eating. You must shower at the end of the work shift. Do not take used protective clothing out of the change rooms without your

employer's permission. Your employer is required to provide for laundering or cleaning of your protective clothing.

V. SIGNS AND LABELS

Your employer is required to post warning signs and labels for your protection. Signs must be posted in regulated areas. The signs must warn that a cancer hazard is present, that only authorized employees may enter the area, and that no smoking or eating is allowed. In regulated areas where coke oven emissions are above the permissible exposure limit, the signs should also warn that respirators must be worn.

VI. MEDICAL EXAMINATIONS

If you work in a regulated area at least 30 days per year, your employer is required to provide you with a medical examination every year. The medical examination must include a medical history, a chest x-ray; pulmonary function test; weight comparison; skin examination; a urinalysis and a urine cytology exam for the early detection of urinary or lung cancer. When you are either 45 years or older or have 5 or more years employment in the regulated areas, medical examinations are required every 6 months and include an updated work history; an updated medical history; pulmonary function test; weight comparison; skin examination; a urinalysis; and a urine cytology exam. The examining physician will provide a written opinion to your employer containing the results of the medical exams. You should also receive a copy of this opinion.

VII. OBSERVATION OF MONITORING

Your employer is required to monitor your exposure to coke oven emissions and you are entitled to observe the monitoring procedure. You are entitled to receive an explanation of the measurement procedure, observe the steps taken in the measurement procedure, and to record the results obtained. When the monitoring procedure is taking place in an area where respirators or personal protective clothing and equipment are required to be worn, you must also be provided with and must wear the protective clothing and equipment.

VIII. ACCESS TO RECORDS

You or your representative are entitled to records of your exposure to coke oven emissions upon request to your employer. Your medical examination records can be furnished to your physician upon request to your employer.

IX. TRAINING AND EDUCATION

Additional information on all of these items plus training as to hazards of coke oven emissions and the engineering and work practice controls associated with your job will also be provided by your employer.

[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 98-02-030, § 296-62-20027, filed 12/31/97, effective 1/31/98; Order 77-14, Appendix A (codified as WAC 296-62-20027), filed 7/25/77.]

WAC 296-62-20029 Appendix B—Industrial hygiene and medical surveillance guidelines.

APPENDIX B

INDUSTRIAL HYGIENE AND MEDICAL
SURVEILLANCE GUIDELINES

I. INDUSTRIAL HYGIENE GUIDELINES

- (1) Sampling. (Benzene-Soluble Fraction Total Particulate Matter.)

Samples collected should be full shift (8-hour) samples. Sampling should be done using a personal sampling pump with pulsation damper at a flow rate of 2 liters per minute. Samples should be collected on 0.8 micrometer pore size silver membrane filters (37 mm diameter) preceded by Gelman glass fiber type A filters encased in three-piece plastic (polystyrene) field monitor cassettes. The cassette face cap should be on and the plug removed. The rotameter should be checked every hour to ensure that proper flow rates are maintained.

A minimum of three full-shift samples should be collected for each job classification on each battery, at least one during the day and the night. If disparate results are obtained for particular job classification, sampling should be repeated. It is advisable to sample each shift on more than one day to account for environmental variables (wind, precipitation, etc.) which may affect sampling. Differences in exposures among different work shifts may indicate a need to improve work practices on a particular shift. Sampling results from different shifts for each job classification should not be averaged. Multiple samples from same shift may be used to calculate an average exposure for a particular job classification.

- (2) Analysis.

(a) All extraction glassware is cleaned with dichromic acid cleaning solution, rinsed with tap water, then deionized water, acetone, and allowed to dry completely. The glassware is rinsed with nanograde benzene before use. The Teflon cups are cleaned with benzene then with acetone.

(b) Pre-weigh the 2 ml Perkin-Elmer Teflon cups to one hundredth of a milligram on a Perkin-Elmer autobalance AD 2. Tare weight of the cups is about 50 mg.

(c) Place the silver membrane filter and glass fiber filter into a 15 ml test tube.

(d) Extract with 5 ml of benzene for five minutes in an ultrasonic cleaner.

(e) Filter the extract in 15 ml medium glass fritted funnels.

(f) Rinse test tube and filters with two 1.5 ml aliquots of benzene and filter through the fritted glass funnel.

(g) Collect the extract and two rinses in a 10 ml Kontes graduated evaporative concentrator.

(h) Evaporate down to a 1 ml while rinsing the sides with benzene.

(i) Pipet 0.5 ml into the Teflon cup and evaporate to dryness in a vacuum oven at 40°C for 3 hours.

(j) Weight the Teflon cup and the weight gain is due to the benzene soluble residue in half the sample.

II. MEDICAL SURVEILLANCE GUIDELINES

- (1) General.

The minimum requirements for the medical examination for coke oven workers are given in WAC 296-62-20017.

The initial examination is to be provided to all coke oven workers at the time of the initial assignment to a job in the regulated area. The examination includes a 14" x 17" posterior-anterior chest x-ray and a ILO/UC rating to assure some standardization of x-ray reading, pulmonary function tests (FVC and FEV 1.0), weight, urinalysis, skin examination and a sputum and urinary cytologic examination. These tests are to serve as the baseline for comparing the employee's future test results. Periodic exams are to be performed semiannually only on those employees who are 45 years of age or older or who have worked for 5 or more years in the regulated area and include an updated work history; an updated medical history; pulmonary function test; weight comparison; skin examination; a urinalysis; and a urine cytology exam. The examination contents are minimum requirements, additional tests such as lateral and oblique x-rays or additional pulmonary function tests may be performed if deemed necessary.

- (2) Pulmonary function tests.

Pulmonary function tests should be performed in a manner which minimizes subject and operator bias. There has been shown to be learning effects with regard to the results obtained from certain tests, such as FEV 1.0. Best results can be obtained by multiple trials for each subject. The best of three trials or the average of the last three of five trials may be used in obtaining reliable results. The type of equipment used (manufacturer, model, etc.) should be recorded with the results as reliability and accuracy varies and such information may be important in the evaluation of test results. Care should be exercised to obtain the best possible testing equipment.

[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. 98-02-030, § 296-62-20029, filed 12/31/97, effective 1/31/98; Order 77-14, Appendix B (codified as WAC 296-62-20029), filed 7/25/77.]

PART P—HAZARDOUS WASTE OPERATIONS AND
EMERGENCY RESPONSE

WAC 296-62-300 Scope, application, and definitions.

(1) Scope. This section covers employers who have employees who work in the following operations:

(a) Clean-up operations required by a governmental body, whether federal, state, local, or other involving hazardous substances that are conducted at uncontrolled hazardous waste sites (including, but not limited to, the EPA's National Priority Site List (NPL), state priority site lists, sites recommended for the EPA NPL, and initial investigations of government identified sites which are conducted before the presence or absence of hazardous substances has been ascertained);

(b) Corrective actions involving clean-up operations at sites covered by the Resource Conservation and Recovery Act of 1976 (RCRA) as amended (42 U.S.C. 6901 et seq.);

(c) Voluntary clean-up operations at sites recognized by federal, state, local, or other governmental bodies as uncontrolled hazardous waste sites;

(d) Operations involving hazardous wastes that are conducted at treatment, storage, and disposal (TSD) facilities regulated by 40 CFR Parts 264 and 265 pursuant to RCRA; or by agencies under agreement with U.S.E.P.A. to implement RCRA regulations; and

(e) Emergency response operations for releases of, or substantial threats of releases of, hazardous substances without regard to the location of the hazard.

(2) Application.

(a) All requirements of this chapter and chapters 296-24 and 296-155 WAC apply pursuant to their terms to hazardous waste and emergency response operations whether covered by this part or not. If there is a conflict or overlap, the provision more protective of employee safety and health shall apply.

(b) Hazardous substance clean-up operations within the scope of subsection (1)(a), (b), and (c) of this section must comply with all sections of this part except WAC 296-62-3112 and 296-62-3140.

(c) Operations within the scope of subsection (1)(d) of this section must comply only with the requirements of WAC 296-62-3140.

Notes and Exceptions: (i) All provisions of WAC 296-62-3140 cover any treatment, storage, or disposal (TSD) operation regulated by 40 CFR parts 264 and 265 or by state law authorized under RCRA, and required to have a permit or interim status from EPA pursuant to 40 CFR 270.1 or from a state agency pursuant to RCRA.

(ii) Employers who are not required to have a permit or interim status because they are conditionally exempt small quantity generators under 40 CFR 261.5 or are generators who qualify under 40 CFR 262.34 for exemptions from regulation under 40 CFR parts 264, 265, and 270 ("excepted employers") are not covered by WAC 296-62-3140 (1) through (7). Excepted employers who are required by the EPA or state agency to have their employees engage in emergency response or who direct their employees to engage in emergency response are covered by WAC 296-62-3140(8), and cannot be exempted by WAC 296-62-3140 (8)(a). Excepted employers who are not required to have employees engage in emergency response, who direct their employees to evacuate in the case of such emergencies and who meet the requirements of WAC 296-62-3140 (8)(a) are exempt from the balance of WAC 296-62-3140(8).

(iii) If an area is used primarily for treatment, storage or disposal, any emergency response operations in that area shall comply with WAC 296-62-3140(8). In other areas not used primarily for treatment, storage or disposal, any emergency response operations shall comply with WAC 296-62-3112. Compliance with the requirements of WAC 296-62-3112 shall be deemed to be in compliance with the requirements of WAC 296-62-3140(8).

(d) Emergency response operations for releases of, or substantial threats of releases of hazardous substances which are not covered by subsection (1)(a) through (d) of this section must only comply with the requirements of WAC 296-62-3112.

(3) Definitions.

(a) "Buddy system" means a system of organizing employees into work groups in such a manner that each employee of the work group is designated to be observed by at least one other employee in the work group. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency.

(b) "Clean-up operation" means an operation where hazardous substances are removed, contained, incinerated, neutralized, stabilized, cleared-up, or in any other manner processed or handled with the ultimate goal of making the site safer for people or the environment.

(c) "Contamination reduction zone" means the buffer between the exclusion zone and the outermost clean zone.

(d) "Decontamination" means the removal of hazardous substances from employees and their equipment to the extent necessary to preclude the occurrence of foreseeable adverse health effects.

(e) "Emergency response" or "responding to emergencies" means a response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result, in an uncontrolled release of a hazardous substance. Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area or by maintenance personnel are not considered to be emergency responses within the scope of this standard. Responses to release of hazardous substances where there is no potential safety or health hazard (i.e., fire, explosion, or chemical exposure) are not considered to be emergency responses.

(f) "Exclusion zone" means the innermost zone at a site where contamination does occur.

(g) "Facility" means (i) any building structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly-owned treatment works), well, pit, pond, lagoon, impoundment, ditch, storage container, motor vehicle, rolling stock, or aircraft, or (ii) any site or area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located; but does not include any consumer product in consumer use or any waterborne vessel.

(h) "Hazardous materials response (HAZMAT) team" means an organized group of employees, designated by the employer, who are expected to perform work, to handle and control actual or potential leaks or spills of hazardous substances requiring possible close approach to the substance. The team members perform responses to releases or potential releases of hazardous substances for the purpose of control or stabilization of the incident. A HAZMAT team is not a fire brigade nor is a typical fire brigade a HAZMAT team. A HAZMAT team, however, may be a separate component of a fire brigade or fire department.

(i) "Hazardous substance" means any substance designated or listed under (i)(i) through (iv) of this subsection, exposure to which results or may result in adverse effects on the health or safety of employees:

(i) Any substance defined under section 101(14) of CERCLA;

(ii) Any biological agent and other disease-causing agent which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any person, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations in such persons or their offspring;

(iii) Any substance listed by the United States Department of Transportation as hazardous materials under WAC 480-12-195; and

(iv) Hazardous waste as herein defined.

(j) "Hazardous waste" means:

A waste or combination of wastes as defined in (m) of this subsection.

(k) "Hazardous waste operation" means any operation conducted within the scope of this standard.

(l) "Hazardous waste site" or "site" means any facility or location within the scope of this standard at which hazardous waste operations take place.

(m) "Health hazard" means a chemical, mixture of chemicals, or a pathogen for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. It also includes stress due to temperature extremes. Further definition of the terms used above can be found in Appendix A to chapter 296-62 WAC, Part C.

(n) "IDLH" or "immediately dangerous to life or health" means any atmospheric concentration of any toxic, corrosive, or asphyxiant substance that poses an immediate threat to life or would cause irreversible or delayed adverse health effects or would interfere with an individual's ability to escape from a dangerous atmosphere.

(o) "Oxygen deficiency" means that concentration of oxygen by volume below which atmosphere supplying respiratory protection must be provided. It exists in atmospheres where the percentage of oxygen by volume is less than 19.5 percent oxygen.

(p) "Permissible exposure limit" means the exposure, inhalation, or dermal permissible limit specified in WAC 296-62-075 through 296-62-07515.

(q) "Published exposure level" means the exposure limits published in "NIOSH Recommendations for Occupational Health Standards" dated 1986 incorporated by reference, or if none is specified, the exposure limits published in the standards specified by the American Conference of Governmental Industrial Hygienists in their publication "Threshold Limit Values and Biological Exposure Indices for 1988-89" dated 1988 incorporated by reference.

(r) "Post emergency response" means that portion of an emergency response performed after the immediate threat of a release has been stabilized or eliminated and clean-up of the site has begun. If post emergency response is performed by

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an employer's own employees who were part of the initial emergency response, it is considered to be part of the initial response and not post emergency response. However, if a group of an employer's own employees, separate from the group providing initial response, performs the clean-up operation, then the separate group of employees would be considered to be performing post-emergency response and subject to WAC 296-62-3112(11).

(s) "Qualified person" means a person with specific training, knowledge, and experience in the area for which the person has responsibility and the authority to control.

(t) "Site safety and health supervisor (or official)" means the individual located on a hazardous waste site who is responsible to the employer and has the authority and knowledge necessary to implement the site safety and health plan and verify compliance with applicable safety and health requirements.

(u) "Site work zones" means an exclusion zone, contamination reduction zone, and a clean zone established at a hazardous waste site before clean-up work begins to prevent or reduce the movement of contaminants from the site to uncontaminated areas and to control public, employee, and equipment exposure to hazardous substances.

(i) The exclusion zone is the innermost of the zones and is where contamination does occur. The contamination reduction zone is the zone between the exclusion zone and the clean zone and serves as a transition and buffer between the contaminated and clean zone to further reduce the physical transfer of contaminating substances to the public, employees, and equipment. The clean zone is the outermost of the zones and is a noncontaminated or clean area. The level of contamination in these zones is not defined and some designated exclusion zones can have very little contamination directly affecting employees.

(ii) The contaminated reduction corridors are the designated areas within the contaminated reduction zone for the decontamination of personnel and equipment.

(v) "Small quantity generator" means a generator of hazardous wastes who in any calendar month generates no more than 1000 kilograms (2205 pounds) of hazardous waste in that month.

(w) "Uncontrolled hazardous waste site" means an area identified as an uncontrolled hazardous waste site by a governmental body, whether federal, state, local, or other where an accumulation of hazardous substances creates a threat to the health and safety of individuals or the environment or both. Some sites are found on public lands, such as those created by former municipal, county, or state landfills where illegal or poorly managed waste disposal has taken place. Other sites are found on private property, often belonging to generators or former generators of hazardous substance waste. Examples of such sites include, but are not limited to, surface impoundments, landfills, dumps, and tank or drum farms. Normal operations at TSD sites are not covered by this definition.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-62-300, filed 7/20/94, effective 9/20/94; 91-24-017 (Order 91-07), § 296-62-300, filed 11/22/91, effective 12/24/91; 90-20-091 (Order 90-14), § 296-62-300, filed 10/1/90, effective 11/15/90; 89-21-018 (Order 89-10), § 296-62-300, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-300, filed 10/6/88, effective 11/7/88.]

[Title 296 WAC—p. 1739]

WAC 296-62-3010 Safety and health program.

Note: Safety and health programs developed and implemented to meet other federal, state, or local regulations are considered acceptable in meeting this requirement if they cover or are modified to cover the topics required in this section. An additional or separate safety and health program is not required by this section.

(1) General.

(a) Employers shall develop and implement a written safety and health program for their employees involved in hazardous waste operations. The program shall be designed to identify, evaluate, and control safety and health hazards and provide for emergency response for hazardous waste operations.

(b) The written safety and health program shall incorporate the following:

(i) An organizational structure;

(ii) A comprehensive workplan;

(iii) A site-specific safety and health plan which need not repeat the employer's standard operating procedures required in (b)(vi) of this subsection;

(iv) The safety and health training program;

(v) The medical surveillance program;

(vi) The employer's standard operating procedures for safety and health; and

(vii) Any necessary interface between general program and site specific activities.

(c) Site excavation. Site excavations created during initial site preparation or during hazardous waste operations shall be shored or sloped as appropriate to prevent accidental collapse in accordance with subpart N of chapter 296-155 WAC.

(d) Contractors and subcontractors. An employer who retains contractor or subcontractor services for work in hazardous waste operations shall inform those contractors, subcontractors, or their representatives of the site emergency response procedures and any potential fire, explosion, health, safety, or other hazards of the hazardous waste operation that have been identified by the employer, including those identified in the employer's information program.

(e) Program availability. The written safety and health program shall be made available to any contractor or subcontractor or their representative who will be involved with the hazardous waste operation; to employees; to employee designated representatives; to WISHA personnel, and to personnel of other federal, state, or local agencies with regulatory authority over the site.

(2) Organizational structure part of the site program.

(a) The organizational structure part of the program shall establish the specific chain of command and specify the overall responsibilities of supervisors and employees. It shall include at a minimum, the following elements:

(i) A general supervisor who has the responsibility and authority to direct all hazardous waste operations.

(ii) A site safety and health supervisor who has the responsibility and authority to develop and implement the site safety and health plan and verify compliance.

(iii) All other personnel needed for hazardous waste site operations and emergency response and their general functions and responsibilities.

(iv) The lines of authority, responsibility, and communication.

(b) The organizational structure shall be reviewed and updated as necessary to reflect the current status of waste site operations.

(3) Comprehensive workplan part of the site program. The comprehensive workplan shall address the tasks and objectives of site operations and the logistics and resources required to reach those tasks and objectives.

(a) The comprehensive workplan shall address anticipated clean-up activities as well as normal operating procedures which need not repeat the employers procedures available elsewhere.

(b) The comprehensive workplan shall define work tasks and objectives and identify the methods for accomplishing those tasks and objectives.

(c) The comprehensive workplan shall establish personnel requirements for implementing the plan.

(d) The comprehensive workplan shall provide for the implementation of the training required in WAC 296-62-3040.

(e) The comprehensive workplan shall provide for the implementation of the required informational programs required in WAC 296-62-3080.

(f) The comprehensive workplan shall provide for the implementation of the medical surveillance program described in WAC 296-62-3050.

(4) Site-specific safety and health plan part of the program.

(a) General. The site safety and health plan, which must be kept on site, shall address the safety and health hazards of each phase of site operation; and include the requirements and procedures for employee protection.

(b) Elements. The site safety and health plan, as a minimum, shall address the following:

(i) Names of key personnel and alternates responsible for site safety and health, including a site safety and health supervisor.

(ii) A safety and health risk or hazard analysis for each site task and operation found in the workplan.

(iii) Employee training assignments to assure compliance with WAC 296-62-3040.

(iv) Personal protective equipment to be used by employees for each of the site tasks and operations being conducted as required by the personal protective equipment program in WAC 296-62-3060(5).

(v) Medical surveillance requirements in accordance with the program in WAC 296-62-3050.

(vi) Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment to be used.

(vii) Site control measures in accordance with the site control program required in WAC 296-62-3030.

(viii) Decontamination procedures in accordance with WAC 296-62-3100.

(ix) An emergency response plan meeting the requirements of WAC 296-62-3110 for safe and effective responses

to emergencies, including the necessary PPE and other equipment.

(x) Confined space and permit-required confined space entry procedures as addressed in chapter 296-62 WAC, Part M.

(xi) A spill containment program meeting the requirements of WAC 296-62-3090.

(c) Preentry briefing. The site specific safety and health plan shall provide for preentry briefings to be held prior to initiating any site activity, and at such other times as necessary to ensure that employees are apprised of the site safety and health plan and that this plan is being followed. The information and data obtained from site characterization and analysis work required in WAC 296-62-3020 shall be used to prepare and update the site safety and health plan.

(d) Effectiveness of site safety and health plan. Inspections shall be conducted by the site safety and health supervisor or, in the absence of that individual, another individual who is knowledgeable in occupational safety and health acting on behalf of the employer as necessary to determine the effectiveness of the site safety and health plan. Any deficiencies in the effectiveness of the site safety and health plan shall be corrected by the employer.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-3010, filed 1/18/95, effective 3/1/95; 89-21-018 (Order 89-10), § 296-62-3010, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3010, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3020 Site characterization and analysis.

(1) General. Hazardous waste sites shall be evaluated in accordance with this section to identify specific site hazards and to determine the appropriate safety and health control procedures needed to protect employees from the identified hazards.

(2) Preliminary evaluation. A preliminary evaluation of a site's characteristics shall be performed prior to site entry by a qualified person in order to aid in the selection of appropriate employee protection methods prior to site entry. Immediately after initial site entry, a more detailed evaluation of the site's specific characteristics shall be performed by a qualified person in order to further identify existing site hazards and to further aid in the selection of the appropriate engineering controls and personal protective equipment for the tasks to be performed.

(3) Hazard identification. All suspected conditions that may pose inhalation or skin absorption hazards that are immediately dangerous to life or health (IDLH), or other conditions that may cause death or serious harm, shall be identified during the preliminary survey and evaluated during the detailed survey. Examples of such hazards include, but are not limited to, confined space entry, potentially explosive or flammable situations, visible vapor clouds, or areas where biological indicators such as dead animals or vegetation are located.

(4) Required information. The following information to the extent available shall be obtained by the employer prior to allowing employees to enter a site:

(a) Location and approximate size of the site.

(b) Description of the response activity and/or the job task to be performed.

(c) Duration of the planned employee activity.

(d) Site topography and accessibility by air and roads.

(e) Safety and health hazards expected at the site.

(f) Pathways for hazardous substance dispersion.

(g) Present status and capabilities of emergency response teams that would provide assistance to hazardous waste clean-up site employees at the time of an emergency.

(h) Hazardous substances and health hazards involved or expected at the site and their chemical and physical properties.

(5) Personal protective equipment. Personal protective equipment (PPE) shall be provided and used during initial site entry in accordance with the following requirements:

(a) Based upon the results of the preliminary site evaluation, an ensemble of PPE shall be selected and used during initial site entry which will provide protection to a level of exposure below established permissible exposure limits and published exposure levels for known or suspected hazardous substances and health hazards, and which will provide protection against other known and suspected hazards identified during the preliminary site evaluation. If there is no permissible exposure limit or published exposure level, the employer may use other published studies and information as a guide to appropriate personal protective equipment. Level A and Level B personal protective equipment is required for the most hazardous actual or potential exposures.

(b) If positive-pressure self-contained breathing apparatus is not used as part of the entry ensemble, and if respiratory protection is warranted by the potential hazards identified during the preliminary site evaluation, an escape self-contained breathing apparatus of at least five minute's duration shall be carried by employees during initial site entry.

(c) If the preliminary site evaluation does not produce sufficient information to identify the hazards or suspected hazards of the site an ensemble providing protection equivalent to Level B PPE shall be provided as minimum protection and direct reading instruments shall be used as appropriate for identifying IDLH conditions. (See WAC 296-62-3170 - Appendix B for a description of Level B hazards and the recommendations for Level B protective equipment.)

(d) Once the hazards of the site have been identified, the appropriate PPE shall be selected and used in accordance with WAC 296-62-3060.

(6) Monitoring. The following monitoring shall be conducted during initial site entry when the site evaluation produces information that shows the potential for ionizing radiation or IDLH conditions, or when the site information is not sufficient to rule out these possible conditions:

(a) Monitoring with direct reading instruments for hazardous levels of ionizing radiation.

(b) Monitoring the air with appropriate direct reading equipment (i.e., combustible gas meters, detector tubes) for IDLH and other conditions that may cause death or serious harm (combustible or explosive atmospheres, oxygen deficiency, toxic substances).

(c) Visually observing for signs of actual or potential IDLH or other dangerous conditions.

(d) An ongoing air monitoring program in accordance with WAC 296-62-3070 shall be implemented after site characterization has determined the site is safe for the start-up of operations.

(7) Risk identification. Once the presence and concentrations of specific hazardous substances and health hazards have been established, the risks associated with these substances shall be identified. Employees who will be working on the site shall be informed of any risks that have been identified. In situations covered by chapter 296-62 WAC, Part C, training required by those standards need not be duplicated.

Note: Risks to consider include, but are not limited to:

- (a) Exposures exceeding the permissible exposure limits and published exposure levels.
- (b) IDLH concentrations.
- (c) Potential skin absorption and irritation sources.
- (d) Potential eye irritation sources.
- (e) Explosion sensitivity and flammability ranges.
- (f) Oxygen deficiency.

(8) Employee notification. Any information concerning the chemical, physical, and toxicologic properties of each substance known or expected to be present on site that is available to the employer and relevant to the duties an employee is expected to perform shall be made available to all employees prior to the commencement of their work activities. The employer may utilize information developed for the hazard communication standard, chapter 296-62 WAC, Part C, for this purpose.

[Statutory Authority: Chapter 49.17 RCW. 94-16-145, § 296-62-3020, filed 8/3/94, effective 9/12/94; 90-20-091 (Order 90-14), § 296-62-3020, filed 10/1/90, effective 11/15/90; 89-21-018 (Order 89-10), § 296-62-3020, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3020, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3030 Site control. (1) General. Appropriate site control procedures shall be implemented to control employee exposure to hazardous substances before clean-up work begins.

(2) Site control program. A site control program for protecting employees which is part of the employer's site safety and health program required in WAC 296-62-3010 shall be developed during the planning stages of a hazardous waste clean-up operation and modified as necessary as new information becomes available.

(3) Elements of the site control program. The site control program shall, as a minimum, include: A site map; site work zones; the use of a "buddy system"; site communications including alerting means for emergencies; the standard operating procedures or safe work practices; and, identification of nearest medical assistance. Where these requirements are covered elsewhere they need not be repeated.

(4) Site work zones.

(a) The site work zones shall be the exclusion zone, contamination reduction zone, and the clean zone.

(b) Decontamination procedures shall take place in the contamination reduction corridor consisting, if practical, of separate corridors for personnel and for equipment.

(c) An entry and exit check point must be established at the boundary of the exclusion zone to regulate the flow of personnel and equipment into and out of the zone. Exit from the exclusion zone must be through a contamination reduction corridor.

(d) Access to the contamination reduction zone from the clean zone is through a control point. Personnel entering or working in the contamination zone shall wear the prescribed personnel protective equipment, if required, for working in

this zone. Entering the clean zone requires removal of any protective equipment worn in the contamination reduction zone.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-62-3030, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3030, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3040 Training. (1) General.

(a) All employees working on site (such as but not limited to equipment operators, general laborers, and others) exposed to hazardous substances, health hazards, or safety hazards, and their supervisors and management responsible for the site, shall receive training meeting the requirements of this subsection before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards, and they shall review training as specified in this subsection.

(b) Employees shall not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility.

(2) Elements to be covered. The training shall thoroughly cover the following:

(a) Names of personnel and alternates responsible for site safety and health;

(b) Safety, health, and other hazards present on the site;

(c) Use of personal protective equipment;

(d) Work practices by which the employee can minimize risks from hazards;

(e) Safe use of engineering controls and equipment on the site;

(f) Medical surveillance requirements including recognition of symptoms and signs which might indicate overexposure to hazards; and

(g) The contents of items (vii) through (x) of the site safety and health plan set forth in WAC 296-62-3010 (4)(b).

(3) Initial training. General site workers (such as equipment operators, general laborers, and supervisory personnel) engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards shall receive the following required training:

(a) General site workers required to wear Level A or Level B personal protective equipment because of the types of hazards to which they are exposed or have the potential for being exposed are required to have 80 hours of training and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor.

(b) General site workers required to wear Level C or D personal protective equipment, equipment operators or transport vehicle operators, are required to have 40 hours of training and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor.

(c) General site workers on site only occasionally for specific limited tasks, and supervisors not working in the two inner zones are required to have 24 hours of training. For example, certain Environmental Protection Agency, and department of ecology employees, labor and industries inspectors and other short-term monitoring and surveying personnel would be required to only have 24 hours of training if they are on-site only occasionally for a specific limited task

and are unlikely to be exposed over permissible exposure levels and published exposure limits. A minimum of one day actual field experience under direct supervision is also required.

(d) Workers regularly on site who work in areas which have been monitored and fully characterized indicating that exposures are under permissible exposure limits and published exposure limits where respirators are not necessary, and the characterization indicates that there are no health hazards or the possibility of an emergency developing, shall receive a minimum of 24 hours of instruction off the site and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

(e) Workers with 24 hours of training who are covered by (c) and (d) of this subsection, and who become general site workers or who are required to wear respirators, shall have the additional 16 hours and two days of training necessary to total the training specified in (b) of this subsection.

(4) Management and supervisor training. On-site management and supervisors directly responsible for, or who supervise employees engaged in, hazardous waste operations shall receive the same initial training as listed in subsection (3) of this section, and three days of supervised field experience and at least eight additional hours of specialized training at the time of job assignment on such topics as, but not limited to, the employer's safety and health program and the associated employee training program, personal protective equipment program, spill containment program, and health hazard monitoring procedure and techniques.

(5) Law enforcement at illicit drug labs.

Exception: WISHA did not intend application of the 80 hour training requirement to law enforcement personnel required to enter illicit drug labs, secure the premise, and obtain necessary evidence for law enforcement purposes. Attendance at a specific 40 hours course, such as that presented by the criminal justice training commission, is acceptable.

Note: If cleanup activities are conducted by law enforcement personnel, then appropriate hazardous waste cleanup training would be required.

(6) Training course content.

(a) 40 and 80 hour hazardous waste cleanup courses. As a minimum, the training course content for the 40 hour and 80 hour training program shall include the following topics:

(i) Overview of the applicable sections of Part P of chapter 296-62 WAC and the elements of an employer's effective occupational safety and health program.

(ii) Effect of chemical exposure to hazardous substances (i.e., toxicity, carcinogens, irritants, sensitizers, etc.).

(iii) Effects of biological and radiological exposures.

(iv) Fire and explosion hazards (i.e., flammable and combustible liquids, reactive materials).

(v) General safety hazards, including electrical hazards, powered equipment hazards, walking-working surface hazards and those hazards associated with hot and cold temperature extremes.

(vi) Permit-required confined space, tank, and vault hazards and entry procedures.

(vii) Names of personnel and alternates, where appropriate, responsible for site safety and health at the site.

(viii) Specific safety, health, and other hazards that are to be addressed at a site and in the site safety and health plan.

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(ix) Use of personal protective equipment and the implementation of the personal protective equipment program.

(x) Work practices that will minimize employee risk from site hazards.

(xi) Safe use of engineering controls and equipment and any new relevant technology or procedure.

(xii) Content of the medical surveillance program and requirements, including the recognition of signs and symptoms of overexposure to hazardous substances.

(xiii) The contents of an effective site safety and health plan.

(xiv) Use of monitoring equipment with "hands-on" experience and the implementation of the employee and site monitoring program.

(xv) Implementation and use of the information program.

(xvi) Drum and container handling procedures and the elements of a spill containment program.

(xvii) Selection and use of material handling equipment.

(xviii) Methods for assessment of risk and handling of radioactive wastes.

(xix) Methods for handling shock-sensitive wastes.

(xx) Laboratory waste pack handling procedures.

(xxi) Container sampling procedures and safeguards.

(xxii) Safe preparation procedures for shipping and transport of containers.

(xxiii) Decontamination program and procedures.

(xxiv) Emergency response plan and procedures including first aid.

(xxv) Safe site illumination levels.

(xxvi) Site sanitation procedures and equipment for employee needs.

(xxvii) Review of the applicable appendices to Part P of chapter 296-62 WAC.

(xxviii) Overview and explanation of WISHA's hazard communication standard Part C of chapter 296-62 WAC.

(xxix) Sources of reference, additional information and efficient use of relevant manuals and hazard coding systems.

(xxx) Principles of toxicology and biological monitoring.

(xxxi) Rights and responsibilities of employees and employers under WISHA and CERCLA.

(xxxii) "Hands-on" field exercises and demonstrations.

(b) 24-hour hazardous waste cleanup course. As a minimum, the 24-hour training course required in WAC 296-62-3040 (3)(c) and (d) for employees engaged in occasional visits to uncontrolled hazardous waste sites shall include the following topics where they are applicable to the job function to be performed:

(i) Overview of applicable sections of Part P of chapter 296-62 WAC and the elements of the employer's effective occupational safety and health program.

(ii) Employee rights and responsibilities under WISHA and CERCLA.

(iii) Overview of relevant chemical exposures to hazardous substances (i.e., toxics, carcinogens, irritants, sensitizers, etc.).

(iv) Overview of the principles of toxicology and biological monitoring.

(v) Use of monitoring equipment with hands-on practice and an overview of a site monitoring program.

(vi) Overview of site hazards including fire and explosion, confined spaces, oxygen deficiency, electrical hazards, powered equipment hazards, walking-working surface hazards.

(vii) The contents of an effective site safety and health plan.

(viii) Use of personal protective equipment and the implementation of the personal protective equipment program.

(ix) Work practices that will minimize employee risk from site hazards.

(x) Site simulations with "hands-on" exercises and practice.

(xi) Emergency response planning and response including first aid.

(xii) Content of the medical surveillance program and requirements, including the recognition of signs and symptoms of overexposure to hazardous substances.

(xiii) Decontamination programs and procedures.

(xiv) Safe use of engineering controls and equipment.

(xv) Sources of references and efficient use of relevant manuals and knowledge of hazard coding systems.

(c) 16-hour supplemental training for hazardous waste sites. As a minimum, employees who have received 24 hours of training for hazardous waste site operations shall receive training in the following topics before they are allowed to work as general site workers or if they are required to wear respirators:

(i) Relevant chemical exposures to hazardous substances beyond that previously covered.

(ii) Site hazards including fire and explosion, confined spaces, oxygen deficiency, electrical, powered equipment, and walking-working surfaces beyond that previously covered.

(iii) Names of personnel and alternates responsible for site safety and health at the site, where appropriate.

(iv) Use of monitoring equipment and the implementation of the employee and the site monitoring program beyond that previously covered.

(v) Implementation and use of the informational program.

(vi) Drum and container handling procedures and the elements of a spill containment program.

(vii) Selection and use of material handling equipment.

(viii) Methods for assessment of risk and handling of radioactive wastes.

(ix) Methods for handling shock-sensitive wastes.

(x) Laboratory waste pack handling procedures.

(xi) Container sampling procedures and safeguards.

(xii) Safe preparation procedures for shipping and transport of containers.

(xiii) Decontamination program and procedures.

(xiv) Safety site illumination levels.

(xv) Site sanitation procedures and equipment.

(xvi) Review of the applicable appendices to Part P of chapter 296-62 WAC.

(xvii) Overview and explanation of WISHA's Hazard communication standard Part C of chapter 296-62 WAC.

(xviii) Sources of reference and additional information.

(d) Additional 8 hours of training for supervisors and managers. Supervisors and managers shall receive an additional eight hours of training in the following subjects:

(i) Management of hazardous wastes and their disposal.

(ii) Federal, state, and local agencies to be contacted in the event of a release of hazardous substances.

(iii) Management of emergency procedures in the event of a release of hazardous substances.

(7) Qualifications for trainers. Trainers shall be qualified to instruct employees about the subject matter that is being presented in training. Such trainers shall have satisfactorily completed a training program for teaching the subjects they are expected to teach, or they shall have the academic credentials and instructional experience necessary for teaching the subjects. Instructors shall demonstrate competent instructional skills and knowledge of the applicable subject matter.

(8) Training certification. Employees and supervisors that have received and successfully completed the training and field experience specified in subsections (1) through (4) of this section shall be certified by their instructor or the head instructor and trained supervisor as having successfully completed the necessary training. A written certificate shall be given to each person so certified. Any person who has not been so certified or who does not meet the requirements of subsection (11) of this section shall be prohibited from engaging in hazardous waste operations.

(9) Emergency response. Employees who are engaged in responding to hazardous emergency situations at hazardous waste clean-up sites that may expose them to hazardous substances shall be trained in how to respond to expected emergencies.

(10) Refresher training. Employees specified in subsection (1) of this section, and managers specified in subsection (4) of this section, shall receive eight hours of refresher training annually on the items specified in subsections (2) and/or (4) of this section, any critique of incidents that have occurred in the past year that can serve as training examples of related work, and other relevant topics.

(11) Equivalent training. Employers who can show by documentation or certification that an employee's work experience and/or training has resulted in training equivalent to that training required in subsections (1) through (4) of this section shall not be required to provide the initial training requirements of those sections to such employees and shall provide a copy of the certification or documentation to the employee upon request. However, certified employees or employees with equivalent training new to a site shall receive appropriate, site specific training before site entry and have appropriate supervised field experience at the new site. Equivalent training includes any academic training or the training that existing employees might have already received from actual hazardous waste site work experience. The 80 hours of instruction required can be fulfilled as follows:

(a) Instruction can include a combination of presently available 40 hour training sessions and other related classes or training including additional supervised on-the-job training as long as material covered includes elements required in the training section WAC 296-62-3040(2) of the regulations. A single 80 hour training session is also acceptable.

(b) Previously attended courses including eight-hour refresher courses apply toward the 80 hour requirement and need not be repeated.

(c) Documentation of previous experience and training by qualified trainers is required of employers and must be available to inspectors for review.

(d) When calculating hours of training, WISHA assumes a "normal" work day to be eight hours with sufficient time for lunch and other breaks.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-62-3040, filed 1/18/95, effective 3/1/95; 91-24-017 (Order 91-07), § 296-62-3040, filed 11/22/91, effective 12/24/91; 90-20-091 (Order 90-14), § 296-62-3040, filed 10/1/90, effective 11/15/90; 89-21-018 (Order 89-10), § 296-62-3040, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3040, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3050 Medical surveillance. (1) General. Employers engaged in operations specified in WAC 296-62-300 (1)(a) through (d) and not covered by WAC 296-62-300(2), exceptions; and employers of employees specified in WAC 296-62-3112(9) shall institute a medical surveillance program in accordance with this subsection.

(2) Employees covered. The medical surveillance program shall be instituted by the employer for the following employees:

(a) All employees who are or may be exposed to hazardous substances or health hazards at or above the permissible exposure limits or, if there is no permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year;

(b) All employees who wear a respirator for 30 days or more a year or as required by WAC 296-62-071; and

(c) All employees who are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation; and

(d) Members of HAZMAT teams.

(3) Frequency of medical examinations and consultations. Medical examinations and consultations shall be made available by the employer to each employee covered under subsection (1) of this section on the following schedules:

(a) For employees covered under WAC 296-62-3050 (2)(a), (b), and (d):

(i) Prior to assignment;

(ii) At least once every twelve months for each employee covered unless the attending physician believes a longer interval (not greater than biennially) is appropriate;

(iii) At termination of employment or reassignment to an area where the employee would not be covered if the employee has not had an examination within the last six months;

(iv) As soon as possible upon notification by an employee that the employee has developed signs or symptoms indicating possible overexposure to hazardous substances or health hazards, or that the employee has been injured or exposed above the permissible exposure limits, or published exposure levels in an emergency situation;

(v) At more frequent times, if the examining physician determines that an increased frequency of examination is medically necessary.

(b) For employees covered under subsection (2)(c) of this section and for all employees including those employees covered by WAC 296-62-300 (1)(e) who may have been injured, received a health impairment, developed signs or symptoms which may have resulted from exposure to hazardous substances resulting from an emergency incident, or exposed during an emergency incident to hazardous substances at concentrations above the permissible exposure limits or the published exposure levels without the necessary personal protective equipment being used:

(i) As soon as possible following the emergency incident or development of signs or symptoms;

(ii) At additional times, if the examining physician determines that follow-up examinations or consultations are medically necessary.

(4) Content of medical examinations and consultations.

(a) Medical examinations required by subsection (3) of this section shall include a medical and work history (or updated history if one is in the employee's file) with special emphasis on symptoms related to the handling of hazardous substances and health hazards, and to fitness for duty including the ability to wear any required PPE under conditions (i.e., temperature extremes) that may be expected at the worksite.

(b) The content of medical examinations or consultations made available to employees pursuant to this section shall be determined by the examining physician. The guidelines in the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (See Appendix D, Reference #10) should be consulted.

(5) Examination by a physician and costs. All medical examinations and procedures shall be performed by or under the supervision of a licensed physician, preferably one knowledgeable in occupational medicine, and shall be provided without cost to the employee, without loss of pay, and at a reasonable time and place.

(6) Information provided to the physician. The employer shall provide one copy of this standard and its appendices to the examining physician, and in addition, the following for each employee:

(a) A description of the employee's duties as they relate to the employee's exposures;

(b) The employee's exposure levels or anticipated exposure levels;

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

(d) Information from previous medical examinations of the employee which is not readily available to the examining physician; and

(e) Information required in WAC 296-62-071 through 296-62-07121.

(7) Physician's written opinion.

(a) The employer shall obtain and furnish the employee with a copy of a written opinion from the examining physician containing the following:

(i) The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from work in hazardous waste operations or emergency response or from respirators use.

(ii) The physician's recommended limitations upon the employees assigned work.

(iii) The results of the medical examination and tests if requested by the employee.

(iv) A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further examination or treatment.

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

(8) Recordkeeping.

(a) An accurate record of the medical surveillance required by this section shall be retained. This record shall be retained for the period specified and meet the criteria of Part B of chapter 296-62 WAC.

(b) The record required in (a) of this subsection shall include at least the following information:

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

(ii) Physicians' written opinions, recommended limitations, and results of examinations and tests;

(iii) Any employee medical complaints related to exposure to hazardous substances;

(iv) A copy of the information provided to the examining physician by the employer, with the exception of the standard and its appendices.

[Statutory Authority: Chapter 49.17 RCW. 91-11-070 (Order 91-01), § 296-62-3050, filed 5/20/91, effective 6/20/91; 90-20-091 (Order 90-14), § 296-62-3050, filed 10/11/90, effective 11/15/90; 89-21-018, § 296-62-3050, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3050, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3060 Engineering controls, work practices, and personal protective equipment for employee protection. (1) Engineering controls, work practices, personal protective equipment, or a combination of these shall be implemented in accordance with this section to protect employees from exposure to hazardous substances and health hazards.

(a) Engineering controls, work practices, and PPE for substances regulated in chapter 296-62 WAC.

Engineering controls and work practices shall be instituted to reduce and maintain employee exposure to or below the permissible exposure limits for substances regulated by this chapter, except to the extent that such controls and practices are not feasible.

Note: Engineering controls which may be feasible include the use of pressurized cabs or control booths on equipment, and/or the use of remotely operated material handling equipment. Work practices which may be feasible are removing all nonessential employees from potential exposure during opening of drums, wetting down dusty operations, and locating employees upwind of possible hazards.

(b) Whenever engineering controls and work practices are not feasible, or not required, any reasonable combination of engineering controls, work practices, and PPE shall be used to reduce and maintain exposures to or below the permissible exposure limits or dose limits for substances regulated by chapter 296-62 WAC.

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(c) The employer shall not implement a schedule of employee rotation as a means of compliance with permissible exposure limits or dose limits except when there is no other feasible way of complying with the airborne or dermal dose limits for ionizing radiation.

(d) The provisions of WAC 296-62-080 through 296-62-09013, 296-62-09015 through 296-62-09055, and 296-62-100 through 296-62-130 shall be followed.

(2) Engineering controls, work practices, and personal protective equipment for substances not regulated in chapter 296-62 WAC. An appropriate combination of engineering controls, work practices, and personal protective equipment shall be used to reduce and maintain employee exposure to or below published exposure levels for hazardous substances and health hazards not regulated by chapter 296-62 WAC. The employer may use the published literature and MSDS as a guide in making the employer's determination as to what level of protection the employer believes is appropriate for hazardous substances and health hazards for which there is no permissible exposure limit or published exposure level.

(3) Personal protective equipment selection.

(a) Personal protective equipment (PPE) shall be selected and used which will protect employees from the hazards and potential hazards they are likely to encounter as identified during the site characterization and analysis.

(b) Personal protective equipment selection shall be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the site, the task-specific conditions and duration, and the hazards and potential hazards identified at the site.

(c) Positive pressure self-contained breathing apparatus, or positive pressure air-line respirators equipped with an escape air supply shall be used when chemical exposure levels present will create a substantial possibility of immediate death, immediate serious illness or injury, or impair the ability to escape.

(d) Totally-encapsulating chemical protective suits (protection equivalent to Level A protection as recommended in Appendix B) shall be used in conditions where skin absorption of a hazardous substance may result in a substantial possibility of immediate death, immediate serious illness or injury, or impair the ability to escape.

(e) The level of protection provided by PPE selection shall be increased when additional information or site conditions indicate that increased protection is necessary to reduce employee exposures below permissible exposure limits and published exposure levels for hazardous substances and health hazards. (See WAC 296-62-3170 - Appendix B for guidance on selecting PPE ensembles.)

Note: The level of employee protection provided may be decreased when additional information or site conditions show that decreased protection will not result in increased hazardous exposures to employees.

(f) Personal protective equipment shall be selected and used to meet the requirements of chapter 296-24 WAC, Part A-2, and additional requirements specified in this part.

(4) Totally-encapsulating chemical protective suits.

(a) Totally-encapsulating suits shall protect employees from the particular hazards which are identified during site characterization and analysis.

(b) Totally-encapsulating suits shall be capable of maintaining positive air pressure. (See WAC 296-62-3160 - Appendix A for a test method which may be used to evaluate this requirement.)

(c) Totally-encapsulating suits shall be capable of preventing inward test gas leakage of more than 0.5 percent. (See WAC 296-62-3160 - Appendix A for a test method which may be used to evaluate this requirement.)

(5) Personal protective equipment (PPE) program. A written personal protective equipment program, which is part of the employer's safety and health program required in WAC 296-62-3010 or 296-62-3140 and which shall be part of the site-specific safety and health plan shall be established. The PPE program shall address the elements listed below. When elements, such as donning and doffing procedures, are provided by the manufacturer of a piece of equipment and are attached to the plan, they need not be rewritten into the plan as long as they adequately address the procedure or element.

- (a) PPE selection based on site hazards,
- (b) PPE use and limitations of the equipment,
- (c) Work mission duration,
- (d) PPE maintenance and storage,
- (e) PPE decontamination and disposal,
- (f) PPE training and proper fitting,
- (g) PPE donning and doffing procedures,
- (h) PPE inspection procedures prior to, during, and after use,

(i) Evaluation of the effectiveness of the PPE program, and

(j) Limitations during temperature extremes, heat stress, and other appropriate medical considerations.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-62-3060, filed 7/20/94, effective 9/20/94; 90-20-091 (Order 90-14), § 296-62-3060, filed 10/1/90, effective 11/15/90; 89-21-018, § 296-62-3060, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3060, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3070 Monitoring. (1) General.

(a) Monitoring shall be performed in accordance with this section where there may be a question of employee exposure to concentrations of hazardous substances in order to assure proper selection of engineering controls, work practices, and personal protective equipment so that employees are not exposed to levels which exceed permissible exposure limits or published exposure levels if there are no permissible exposure limits, for hazardous substances.

(b) Air monitoring shall be used to identify and quantify airborne levels of hazardous substances and safety and health hazards in order to determine the appropriate level of employee protection needed on site.

(2) Initial entry. Upon initial entry, representative air monitoring shall be conducted to identify any IDLH condition, exposure over permissible exposure limits or published exposure levels, exposure over a radioactive material's dose limits, or other dangerous condition, such as the presence of flammable atmospheres or oxygen-deficient environments.

(3) Periodic monitoring. Periodic monitoring shall be conducted when the possibility of an IDLH condition or flammable atmosphere has developed or when there is indication that exposures may have risen over permissible exposure limits or published exposure levels since prior monitor-

ing. Situations where it shall be considered whether the possibility that exposures have risen are as follows:

(a) When work begins on a different portion of the site.

(b) When contaminants other than those previously identified are being handled.

(c) When a different type of operation is initiated (e.g., drum opening as opposed to exploratory well drilling).

(d) When employees are handling leaking drums or containers or working in areas with obvious liquid contamination (e.g., a spill or lagoon).

(e) When a sufficient reasonable interval has passed so that exposures may have significantly increased.

(4) Monitoring of high-risk employees. After the actual clean-up phase of any hazardous waste operation commences; for example, when soil, surface water, or containers are moved or disturbed; the employer shall monitor those employees likely to have the highest exposures to hazardous substances and health hazards likely to be present above permissible exposure limits or published exposure levels by using personal sampling frequently enough to characterize employee exposures. If the employees likely to have the highest exposure are over permissible exposure limits or published exposure levels, then monitoring shall continue to determine all employees likely to be above those limits. The employer may utilize a representative sampling approach by documenting that the employees and chemicals chosen for monitoring are based on the criteria stated in this subsection.

Note: It is not required to monitor employees engaged in site characterization operations covered by WAC 296-62-3020.

[Statutory Authority: Chapter 49.17 RCW. 90-20-091 (Order 90-14), § 296-62-3070, filed 10/1/90, effective 11/15/90; 89-21-018, § 296-62-3070, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3070, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3080 Informational programs. Employers shall develop and implement a program which is part of the employer's safety and health program required in WAC 296-62-3010 to inform employees, contractors, and subcontractors (or their representative) actually engaged in hazardous waste operations of the nature, level, and degree of exposure likely as a result of participation in such hazardous waste operations. Employees, contractors, and subcontractors working outside of the operations part of a site are not covered by this standard.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3080, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3080, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3090 Handling drums and containers. (1) General.

(a) Hazardous substances and contaminated soils, liquids, and other residues shall be handled, transported, labeled, and disposed of in accordance with this section.

(b) Drums and containers used during the clean-up shall meet the appropriate DOT, OSHA, WISHA, and EPA regulations for the wastes that they contain.

(c) When practical, drums and containers shall be inspected and their integrity shall be assured prior to being moved. Drums or containers that cannot be inspected before being moved because of storage conditions (i.e., buried beneath the earth, stacked behind other drums, stacked sev-

eral tiers high in a pile, etc.) shall be moved to an accessible location and inspected prior to further handling.

(d) Unlabeled drums and containers shall be considered to contain hazardous substances and handled accordingly until the contents are positively identified and labeled.

(e) Site operations shall be organized to minimize the amount of drum or container movement.

(f) Prior to movement of drums or containers, all employees exposed to the transfer operation shall be warned of the potential hazards associated with the contents of the drums or containers.

(g) United States Department of Transportation specified salvage drums or containers and suitable quantities of proper absorbent shall be kept available and used in areas where spills, leaks, or ruptures may occur.

(h) Where major spills may occur, a spill containment program, which is part of the employer's safety and health program required in WAC 296-62-3010, shall be implemented to contain and isolate the entire volume of the hazardous substance being transferred.

(i) Drums and containers that cannot be moved without rupture, leakage, or spillage shall be emptied into a sound container using a device classified for the material being transferred.

(j) A ground-penetrating system or other type of detection system or device shall be used to estimate the location and depth of buried drums or containers.

(k) Soil or covering material shall be removed with caution to prevent drum or container rupture.

(l) Fire extinguishing equipment meeting the requirements of Part G of chapter 296-24 WAC shall be on hand and ready for use to control incipient fires.

(2) Opening drums and containers. The following procedures shall be followed in areas where drums or containers are being opened:

(a) Where an airline respirator system is used, connections to the source of air supply shall be protected from contamination and the entire system shall be protected from physical damage.

(b) Employees not actually involved in opening drums or containers shall be kept a safe distance from the drums or containers being opened.

(c) If employees must work near or adjacent to drums or containers being opened, a suitable shield that does not interfere with the work operation shall be placed between the employee and the drums or containers being opened to protect the employee in case of accidental explosion.

(d) Controls for drum or container opening equipment, monitoring equipment, and fire suppression equipment shall be located behind the explosion-resistant barrier.

(e) When there is a reasonable possibility of flammable atmospheres being present, material handling equipment and hand tools shall be of the type to prevent sources of ignition.

(f) Drums and containers shall be opened in such a manner that excess interior pressure will be safely relieved. If pressure cannot be relieved from a remote location, appropriate shielding shall be placed between the employee and the drums or containers to reduce the risk of employee injury.

(g) Employees shall not stand upon or work from drums or containers.

(3) Material handling equipment. Material handling equipment used to transfer drums and containers shall be selected, positioned, and operated to minimize sources of ignition related to the equipment from igniting vapors released from ruptured drums or containers.

(4) Radioactive wastes. Drums and containers containing radioactive wastes shall not be handled until such time as their hazard to employees is properly assessed.

(5) Shock-sensitive wastes.

As a minimum, the following special precautions shall be taken when drums and containers containing or suspected of containing shock-sensitive wastes are handled:

(a) All nonessential employees shall be evacuated from the area of transfer.

(b) Material handling equipment shall be provided with explosive containment devices or protective shields to protect equipment operators from exploding containers.

(c) An employee alarm system capable of being perceived above surrounding light and noise conditions shall be used to signal the commencement and completion of explosive waste handling activities.

(d) Continuous communications (i.e., portable radios, hand signals, telephones, as appropriate) shall be maintained between the employee-in-charge of the immediate handling area and the site safety and health supervisor and command post until such time as the handling operation is completed. Communication equipment or methods that could cause shock-sensitive materials to explode shall not be used.

(e) Drums and containers under pressure, as evidenced by bulging or swelling, shall not be moved until such time as the cause for excess pressure is determined and appropriate containment procedures have been implemented to protect employees from explosive relief of the drum.

(f) Drums and containers containing packaged laboratory wastes shall be considered to contain shock-sensitive or explosive materials until they have been characterized.

Caution: Shipping of shock-sensitive wastes may be prohibited under United States Department of Transportation regulations. Employers and their shippers should refer to WAC 480-12-195.

(6) Laboratory waste packs. In addition to the requirements of subsection (4) of this section, the following precautions shall be taken, as a minimum, in handling laboratory waste packs (lab packs):

(a) Lab packs shall be opened only when necessary and then only by an individual knowledgeable in the inspection, classification, and segregation of the containers within the pack according to the hazards of the wastes.

(b) If crystalline material is noted on any container, the contents shall be handled as a shock-sensitive waste until the contents are identified.

(7) Sampling of drum and container contents. Sampling of containers and drums shall be done in accordance with a sampling procedure which is part of the site safety and health plan developed for and available to employees and others at the specific worksite.

(8) Shipping and transport.

(a) Drums and containers shall be identified and classified prior to packaging for shipment.

(b) Drum or container staging areas shall be kept to the minimum number necessary to identify and classify materials safely and prepare them for transport.

(c) Staging areas shall be provided with adequate access and egress routes.

(d) Bulking of hazardous wastes shall be permitted only after a thorough characterization of the materials has been completed.

(9) Tank and vault procedures.

(a) Tanks and vaults containing hazardous substances shall be handled in a manner similar to that for drums and containers, taking into consideration the size of the tank or vault.

(b) Appropriate tank or vault entry procedures as described in chapter 296-62 WAC Part M and the employer's safety and health plan shall be followed whenever employees must enter a tank or vault.

[Statutory Authority: Chapter 49.17 RCW. 93-19-142 (Order 93-04), § 296-62-3090, filed 9/22/93, effective 11/1/93; 91-11-070 (Order 91-01), § 296-62-3090, filed 5/20/91, effective 6/20/91; 89-21-018, § 296-62-3090, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3090, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3100 Decontamination. (1) General. Procedures for all phases of decontamination shall be developed and implemented in accordance with this section.

(2) Decontamination procedures.

(a) A decontamination procedure shall be developed, communicated to employees and implemented before any employees or equipment may enter areas on site where potential for exposure to hazardous substances exists.

(b) Standard operating procedures shall be developed to minimize employee contact with hazardous substances or with equipment that has contacted hazardous substances.

(c) All employees leaving a contaminated area shall be appropriately decontaminated; all contaminated clothing and equipment leaving a contaminated area shall be appropriately disposed of or decontaminated.

(d) Decontamination procedures shall be monitored by the site safety and health supervisor to determine their effectiveness. When such procedures are found to be ineffective, appropriate steps shall be taken to correct any deficiencies.

(3) Location. Decontamination shall be performed in geographical areas that will minimize the exposure of uncontaminated employees or equipment to contaminated employees or equipment.

(4) Equipment and solvents. All equipment and solvents used for decontamination shall be decontaminated or disposed of properly.

(5) Personal protective clothing and equipment.

(a) Protective clothing and equipment shall be decontaminated, cleaned, laundered, maintained, or replaced as needed to maintain their effectiveness.

(b) Employees whose nonimpermeable clothing becomes wetted with hazardous substances shall immediately remove that clothing and proceed to shower. The clothing shall be disposed of or decontaminated before it is removed from the work zone.

(6) Unauthorized employees. Unauthorized employees shall not remove protective clothing or equipment from change rooms.

(7) Commercial laundries or cleaning establishments. Commercial laundries or cleaning establishments that decontaminate protective clothing or equipment shall be informed of the potentially harmful effects of exposures to hazardous substances.

(8) Showers and change rooms. Where the decontamination procedure indicates a need for regular showers and change rooms outside of a contaminated area, they shall be provided and meet the requirements of Part B-1 of chapter 296-24 WAC. If temperature conditions prevent the effective use of water, then other effective means for cleansing shall be provided and used.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3100, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3100, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3110 Emergency response by employees at uncontrolled hazardous waste sites. (1) Emergency response plan.

(a) An emergency response plan shall be developed and implemented by all employers within the scope of WAC 296-62-300 (1)(a) and (b) to handle anticipated emergencies prior to the commencement of hazardous waste operations. The plan shall be in writing and available for inspection and copying by employees, their representatives, WISHA personnel, and other governmental agencies with relevant responsibilities.

(b) Employers who will evacuate their employees from the danger area when an emergency occurs, and who do not permit any of their employees to assist in handling the emergency are exempt from the requirements of this section if they provide an emergency action plan complying with WAC 296-24-567(1).

(2) Elements of an emergency response plan. The employer shall develop an emergency response plan for emergencies which shall address as a minimum, the following:

(a) Preemergency planning.

(b) Personnel roles, lines of authority, and communication.

(c) Emergency recognition and prevention.

(d) Safe distances and places of refuge.

(e) Site security and control.

(f) Evacuation routes and procedures.

(g) Decontamination procedures which are not covered by the site safety and health plan.

(h) Emergency medical treatment and first aid.

(i) Emergency alerting and response procedures.

(j) Critique of response and follow-up.

(k) PPE and emergency equipment.

(3) Procedures for handling emergency incidents.

(a) In addition to the elements for the emergency response plan required in subsection (2) of this section, the following elements shall be included for emergency response plans:

(i) Site topography, layout, and prevailing weather conditions.

(ii) Procedures for reporting incidents to local, state, and federal governmental agencies.

(b) The emergency response plan shall be a separate section of the site safety and health plan.

(c) The emergency response plan shall be compatible and integrated with the disaster, fire and/or emergency response plans of local, state, and federal agencies.

(d) The emergency response plan shall be rehearsed regularly as part of the overall training program for site operations.

(e) The site emergency response plan shall be reviewed periodically and, as necessary, be amended to keep it current with new or changing site conditions or information.

(f) An employee alarm system shall be installed in accordance with WAC 296-24-631 through 296-24-63199 to notify employees of an on-site emergency situation, to stop work activities if necessary, to lower background noise in order to speed communication, and to begin emergency procedures.

(g) Based upon the information available at the time of the emergency, the employer shall evaluate the incident and the site response capabilities and proceed with the appropriate steps to implement the on-site emergency response plan.

[Statutory Authority: Chapter 49.17 RCW. 90-20-091 (Order 90-14), § 296-62-3110, filed 10/1/90, effective 11/15/90; 90-09-026 (Order 90-01), § 296-62-3110, filed 4/10/90, effective 5/25/90; 89-21-018 (Order 89-10), § 296-62-3110, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3110, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3112 Emergency response to hazardous substance releases. This section covers employers whose employees are engaged in emergency response no matter where it occurs except that it does not cover employees engaged in operations specified in WAC 296-62-300 (1)(a) through (d).

Those emergency response organizations who have developed and implemented programs equivalent to this section for handling releases of hazardous substances pursuant to Section 303 of SARA Title III shall be deemed to have met the requirements of this section.

(1) Emergency response plan. An emergency response plan shall be developed and implemented to handle anticipated emergencies prior to the commencement of emergency response operations. The plan shall be in writing and available for inspection and copying by employees, their representatives, and WISHA personnel. Employers who will evacuate their employees from the danger area when an emergency occurs, and who do not permit any of their employees to assist in handling the emergency, are exempt from the requirements of this section if they provide an emergency action plan in accordance with WAC 296-24-567(1).

(2) Elements of an emergency response plan. The employer shall develop an emergency response plan for emergencies which shall address, as a minimum, the following to the extent that they are not addressed elsewhere:

(a) Preemergency planning and coordination with outside parties.

(b) Personnel roles, lines of authority, training, and communication.

(c) Emergency recognition and prevention.

(d) Safe distances and places of refuge.

(e) Site security and control.

(f) Evacuation routes and procedures.

(g) Decontamination.

(h) Emergency medical treatment and first aid.

(i) Emergency alerting and response procedures.

(j) Critique of response and follow-up.

(k) PPE and emergency equipment.

(l) Emergency response organizations may use the local emergency response plan or the state emergency response plan or both, as part of their emergency response plan to avoid duplication. Those items of the emergency response plan that are being properly addressed by the SARA Title III plans may be substituted into their emergency plan or otherwise kept together for the employer and employee's use.

(3) Procedures for handling emergency response.

(a) The senior emergency response official responding to an emergency shall become the individual in charge of a site-specific incident command system (ICS). All emergency responders and their communications shall be coordinated and controlled through the individual in charge of the ICS assisted by the senior official present for each employer.

Note: The "senior official" at an emergency response is the most senior official on the site who has the responsibility for controlling the operations at the site. Initially it is the senior officer on the first-due piece of responding emergency apparatus to arrive on the incident scene. As more senior officers arrive (i.e., battalion chief, fire chief, state law enforcement official, site coordinator, etc.), the position is passed up the line of authority which has been previously established.

(b) The individual in charge of the ICS shall identify, to the extent possible, all hazardous substances or conditions present and shall address as appropriate site analysis, use of engineering controls, maximum exposure limits, hazardous substance handling procedures, and use of any new technologies.

(c) Based on the hazardous substances and/or conditions present, the individual in charge of the ICS shall implement appropriate emergency operations, and assure that the personal protective equipment worn is appropriate for the hazards to be encountered. However, personal protective equipment shall meet, at a minimum, the criteria contained in WAC 296-24-58513 when worn while performing fire fighting operations beyond the incipient stage for any incident.

(d) Employees engaged in emergency response and exposed to hazardous substances presenting an inhalation hazard or potential inhalation hazard shall wear positive pressure self-contained breathing apparatus while engaged in emergency response, until such time that the individual in charge of the ICS determines through the use of air monitoring that a decreased level of respiratory protection will not result in hazardous exposures to employees.

(e) The individual in charge of the ICS shall limit the number of emergency response personnel at the emergency site, in those areas of potential or actual exposure to incident or site hazards, to those who are actively performing emergency operations. However, operations in hazardous areas shall be performed using the buddy system in groups of two or more.

(f) Back-up personnel shall stand by with equipment ready to provide assistance or rescue. Advance first-aid support personnel, as a minimum, shall also stand by with medical equipment and transportation capability.

(g) The individual in charge of the ICS shall designate a safety official, who is knowledgeable in the operations being

implemented at the emergency response site, with specific responsibility to identify and evaluate hazards and to provide direction with respect to the safety of operations for the emergency at hand.

(h) When activities are judged by the safety official to be an IDLH condition and/or to involve an imminent danger condition, the safety official shall have the authority to alter, suspend, or terminate those activities. The safety official shall immediately inform the individual in charge of the ICS of any actions needed to be taken to correct these hazards at the emergency scene.

(i) After emergency operations have terminated, the individual in charge of the ICS shall implement appropriate decontamination procedures.

(j) When deemed necessary for meeting the tasks at hand, approved self-contained compressed air breathing apparatus may be used with approved cylinders from other approved self-contained compressed air breathing apparatus provided that such cylinders are of the same capacity and pressure rating. All compressed air cylinders used with self-contained breathing apparatus shall meet United States Department of Transportation and National Institute for Occupational Safety and Health criteria.

(4) Skilled support personnel. Personnel, not necessarily an employer's own employees, who are skilled in the operation of certain equipment, such as mechanized earth moving or digging equipment or crane and hoisting equipment, and who are needed temporarily to perform immediate emergency support work that cannot reasonably be performed in a timely fashion by an employer's own employees, and who will be or may be exposed to the hazards at an emergency response scene, are not required to meet the training required in this subsection for the employer's regular employees. However, these personnel shall be given an initial briefing at the site prior to their participation in any emergency response. The initial briefing shall include instruction in the wearing of appropriate personal protective equipment, what chemical hazards are involved, and what duties are to be performed. All other appropriate safety and health precautions provided to the employer's own employees shall be used to assure the safety and health of these personnel.

(5) Specialist employees. Employees who, in the course of their regular job duties, work with and are trained in the hazards of specific hazardous substances, and who will be called upon to provide technical advice or assistance at a hazardous substance release incident to the individual in charge, shall receive training or demonstrate competency in the area of their specialization annually.

(6) Training. Training shall be based on the duties and functions to be performed by each responder of an emergency response organization. The skill and knowledge levels required for all new responders, those hired after the effective date of this standard, shall be conveyed to them through training before they are permitted to take part in actual emergency operations on an incident.

Employees who participate, or are expected to participate, in emergency response, shall be given training in accordance with the following:

(a) First responder awareness level. First responders at the awareness level are individuals who are likely to witness

or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They would take no further action beyond notifying the authorities of the release. First responders at the awareness level shall have sufficient training or have had sufficient experience to objectively demonstrate competency in the following areas:

(i) An understanding of what hazardous substances are and the risks associated with them in an incident.

(ii) An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.

(iii) The ability to recognize the presence of hazardous substances in an emergency.

(iv) The ability to identify the hazardous substances, if possible.

(v) An understanding of the role of the first responder awareness individual in the employer's emergency response plan including site security and control and the United States Department of Transportation's Emergency Response Guidebook.

(vi) The ability to realize the need for additional resources and to make appropriate notifications to the communication center.

(b) First responder operations level. First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and protect exposures. First responders at the operational level shall have received at least eight hours of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed for the awareness level and the employer shall so certify:

(i) Knowledge of the basic hazard and risk assessment techniques.

(ii) Know how to select and use proper personal protective equipment provided to the first responder operational level.

(iii) An understanding of basic hazardous materials terms.

(iv) Know how to perform basic control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit.

(v) Know how to implement basic decontamination procedures.

(vi) An understanding of the relevant standard operating procedures and termination procedures.

(c) Hazardous materials technician. Hazardous materials technicians are individuals who respond to releases or potential releases for the purpose of stopping the release. They assume a more aggressive role than a first responder at the operations level in that they will approach the point of release in order to plug, patch, or otherwise stop the release of hazardous substance. Hazardous materials technicians shall have

received at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify:

(i) Know how to implement the employer's emergency response plan.

(ii) Know the classification, identification, and verification of known and unknown materials by using field survey instruments and equipment.

(iii) Be able to function within an assigned role in the incident command system.

(iv) Know how to select and use proper specialized chemical personal protective equipment provided to the hazardous materials technician.

(v) Understand hazard and risk assessment techniques.

(vi) Be able to perform advance control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available with the unit.

(vii) Understand and implement decontamination procedures.

(viii) Understand termination procedures.

(ix) Understand basic chemical and toxicological terminology and behavior.

(d) Hazardous materials specialist. Hazardous materials specialists are individuals who respond with and provide support to hazardous materials technicians. Their duties parallel those of the hazardous materials technician, however, those duties require a more directed or specific knowledge of the various substances they may be called upon to contain. The hazardous materials specialist would also act as the site liaison with federal, state, local, and other government authorities in regard to site activities.

Hazardous materials specialists shall have received at least 24 hours of training equal to the technician level and in addition have competency in the following areas and the employer shall so certify:

(i) Know how to implement the local emergency response plan.

(ii) Understand classification, identification, and verification of known and unknown materials by using advanced survey instruments and equipment.

(iii) Know of the state emergency response plan.

(iv) Be able to select and use proper specialized chemical personal protective equipment provided to the hazardous materials specialist.

(v) Understand in-depth hazard and risk techniques.

(vi) Be able to perform specialized control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available.

(vii) Be able to determine and implement decontamination procedures.

(viii) Have the ability to develop a site safety and control plan.

(ix) Understand chemical, radiological, and toxicological terminology and behavior.

(e) On scene incident commander. Incident commanders, who will assume control of the incident scene beyond the first responder awareness level, shall receive at least 24 hours of training equal to the first responder operations level and in

addition have competency in the following areas and the employer shall so certify:

(i) Know and be able to implement the employer's incident command system.

(ii) Know how to implement the employer's emergency response plan.

(iii) Know and understand the hazards and risks associated with employees working in chemical protective clothing.

(iv) Know how to implement the local emergency response plan.

(v) Know of the state emergency response plan and of the Federal Regional Response Team.

(vi) Know and understand the importance of decontamination procedures.

(7) Trainers. Trainers who teach any of the above training subjects shall have satisfactorily completed a training course for teaching the subjects they are expected to teach, such as the courses offered by the United States National Fire Academy, or they shall have the training and/or academic credentials and instructional experience necessary to demonstrate competent instructional skills and a good command of the subject matter of the courses they are to teach.

(8) Refresher training.

(a) Those employees who are trained in accordance with subsection (6) of this section shall receive annual refresher training of sufficient content and duration to maintain their competencies, or shall demonstrate competency in those areas at least yearly.

(b) A statement shall be made of the training or competency, and if a statement of competency is made, the employer shall keep a record of the methodology used to demonstrate competency.

(9) Medical surveillance and consultation.

(a) Members of an organized and designated HAZMAT team and hazardous materials specialists shall receive a baseline physical examination and be provided with medical surveillance as required in WAC 296-62-3050.

(b) Any emergency response employees who exhibit signs or symptoms which may have resulted from exposure to hazardous substances during the course of an emergency incident, either immediately or subsequently, shall be provided with medical consultation as required in WAC 296-62-3050 (3)(b).

(10) Chemical protective clothing. Chemical protective clothing and equipment to be used by organized and designated HAZMAT team members, or to be used by hazardous materials specialists, shall meet the requirements of WAC 296-62-3060 (3) through (5).

(11) Postemergency response operations. Upon completion of the emergency response, if it is determined that it is necessary to remove hazardous substances, health hazards, and materials contaminated with them (such as contaminated soil or other elements of the natural environment) from the site of the incident, the employer conducting the clean-up shall comply with one of the following:

(a) Meet all of the requirements of WAC 296-62-3010, 296-62-3020, 296-62-3030, 296-62-3040, 296-62-3050, 296-62-3060, 296-62-3070, 296-62-3080, 296-62-3090, 296-62-

3100, 296-62-3110, 296-62-3120, 296-62-3130, and 296-62-3138; or

(b) Where the clean-up is done on plant property using plant or workplace employees, such employees shall have completed the training requirements of WAC 296-24-567(1), 296-62-071, and 296-62-054, and other appropriate safety and health training made necessary by the tasks that they are expected to be performed such as personal protective equipment and decontamination procedures. All equipment to be used in the performance of the clean-up work shall be in serviceable condition and shall have been inspected prior to use.

[Statutory Authority: Chapter 49.17 RCW. 90-20-091 (Order 90-14), § 296-62-3112, filed 10/1/90, effective 11/15/90; 89-21-018, § 296-62-3112, filed 10/10/89, effective 11/24/89.]

WAC 296-62-3120 Illumination. Areas accessible to employees shall be lighted to not less than the minimum illumination intensities listed in Table 1 while any work is in progress:

TABLE 1 - 120.1 — MINIMUM ILLUMINATION
Intensities in Foot-Candles

Foot-candles	Area or operation
5.....	General site area.
3.....	Excavation and waste areas, accessways, active storage areas, loading platforms, refueling, and field maintenance areas.
5.....	Indoors: Warehouses, corridors, hallways, and exitways.
5.....	Tunnels, shafts, and general underground work areas; exception: Minimum of ten foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Mine Safety and Health Administration and the National Institute for Occupational Safety and Health approved cap lights shall be acceptable for use in the tunnel heading.
10.....	General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, and indoor toilets and workrooms).
30.....	First aid stations, infirmaries, and offices.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-62-3120, filed 7/20/94, effective 9/20/94; 89-21-018, § 296-62-3120, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3120, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3130 Sanitation at temporary workplaces. (1) Potable water.

(a) An adequate supply of potable water shall be provided on the site.

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

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

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

(2) Nonpotable water.

(a) Outlets for nonpotable water, such as water for fire fighting purposes shall be identified to indicate clearly that

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the water is unsafe and is not to be used for drinking, washing, or cooking purposes.

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

(3) Toilet facilities.

(a) Toilets shall be provided for employees according to Table 2.

TABLE 2 — TOILET FACILITIES

Number of employees	Minimum number of facilities
20 or fewer	One.
More than 20, fewer than 200	One toilet seat and one urinal per 40 employees.
More than 200	One toilet seat and one urinal per 50 employees.

(b) Under temporary field conditions, provisions shall be made to assure that at least one toilet facility is available.

(c) Hazardous waste sites, not provided with a sanitary sewer shall be provided with the following toilet facilities unless prohibited by local codes:

(i) Chemical toilets;

(ii) Recirculating toilets;

(iii) Combustion toilets; or

(iv) Flush toilets.

(d) The requirements of this section for sanitation facilities shall not apply to mobile crews having transportation readily available to nearby toilet facilities.

(e) Doors entering toilet facilities shall be provided with entrance locks controlled from inside the facility.

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

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

(6) Washing facilities. The employer shall provide adequate washing facilities for employees engaged in operations where hazardous substances may be harmful to employees. Such facilities shall be in near proximity to the worksite, in areas where exposures are below permissible exposure limits and published exposure levels and which are under the controls of the employer, and shall be so equipped as to enable employees to remove hazardous substances from themselves.

(7) Showers and change rooms. When hazardous waste clean-up or removal operations commence on a site and the duration of the work will require six months or greater time to complete, the employer shall provide showers and change rooms for all employees exposed to hazardous substances and health hazards involved in hazardous waste clean-up or removal operations.

(a) Showers shall be provided and shall meet the requirements of WAC 296-24-12009(3).

(b) Change rooms shall be provided and shall meet the requirements of WAC 296-24-12011. Change rooms shall consist of two separate change areas separated by the shower area required in (a) of this subsection. One change area, with an exit leading off the worksite, shall provide employees with a clean area where they can remove, store, and put on street

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clothing. The second area, with an exit to the worksite, shall provide employees with an area where they can put on, remove and store work clothing and personal protective equipment.

(c) Showers and change rooms shall be located in areas where exposures are below the permissible exposure limits and published exposure levels. If this cannot be accomplished, then a ventilation system shall be provided that will supply air that is below the permissible exposure limits and published exposure levels.

(d) Employers shall assure that employees shower at the end of their work shift and when leaving the hazardous waste site.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3130, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3130, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3138 New technology programs. (1) The employer shall develop and implement procedures for the introduction of effective new technologies and equipment developed for the improved protection of employees working with hazardous waste clean-up operations, and the same shall be implemented as part of the site safety and health program to assure that employee protection is being maintained.

(2) New technologies, equipment or control measures available to the industry, such as the use of foams, absorbents, adsorbents, neutralizers, or other means to suppress the level of air contaminants while excavating the site or for spill control, shall be evaluated by employers or their representatives. Such an evaluation shall be done to determine the effectiveness of the new methods, materials, or equipment before implementing their use on a large scale for enhancing employee protection. Information and data from manufacturers or suppliers may be used as part of the employer's evaluation effort. Such evaluations shall be made available to WISHA upon request.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3138, filed 10/10/89, effective 11/24/89.]

WAC 296-62-3140 Certain operations conducted under the Resource Conservation and Recovery Act of 1976 (RCRA). Employers conducting operations at treatment, storage, and disposal (TSD) facilities specified in WAC 296-62-300 (1)(d) shall provide and implement the programs specified in this section. See the "Notes and Exceptions" of WAC 296-62-300 (2)(c) for employers not covered.

(1) Safety and health program. The employer shall develop and implement a written safety and health program for employees involved in hazardous waste operations that shall be available for inspection by employees, their representatives and WISHA personnel. The program shall be designed to identify, evaluate and control safety and health hazards in their facilities for the purpose of employee protection, to provide for emergency response meeting the requirements of WAC 296-62-3110 and to address as appropriate site analysis, engineering controls, maximum exposure limits, hazardous waste handling procedures and uses of new technologies.

(2) Hazard communication program. The employer shall implement a hazard communication program meeting the

requirements of chapter 296-62 WAC, Part C, as part of the employer's safety and health program.

Note: The exemption for hazardous waste provided in WAC 296-62-054 is applicable to this section.

(3) Medical surveillance program. The employer shall develop and implement a medical surveillance program meeting the requirements of WAC 296-62-3050.

(4) Decontamination program. The employer shall develop and implement a decontamination procedure meeting the requirements of WAC 296-62-3100.

(5) New technology programs. The employer shall develop and implement procedures meeting the requirements of WAC 296-62-3138 for introducing new and innovative equipment into the workplace.

(6) Material handling program. Where employees will be handling drums or containers, the employer shall develop and implement procedures meeting the requirements of WAC 296-62-3090 (1)(b) through (h) and (k), as well as WAC 296-62-3090 (3) and (8), prior to starting such work.

(7) Training program.

(a) New employees. The employer shall develop and implement a training program, which is part of the employer's safety and health program, for employees exposed to health hazards or hazardous substances at TSD operations to enable the employees to perform their assigned duties and functions in a safe and healthful manner so as not to endanger themselves or other employees. The initial training shall be for 24 hours and refresher training shall be for eight hours annually. Employees who have received the initial training required by this section shall be given a written certificate attesting that they have successfully completed the necessary training.

(b) Current employees. Employers who can show by an employee's previous work experience and/or training that the employee has had training equivalent to the initial training required by this section, shall be considered as meeting the initial training requirements of this section as to that employee. Equivalent training includes the training that existing employees might have already received from actual site work experience. Current employees shall receive eight hours of refresher training annually.

(c) Trainers. Trainers who teach initial training shall have satisfactorily completed a training course for teaching the subjects they are expected to teach or they shall have the academic credentials and instruction experience necessary to demonstrate a good command of the subject matter of the courses and competent instructional skills.

(8) Emergency response program.

(a) Emergency response plan. An emergency response plan shall be developed and implemented by all employers. Such plans need not duplicate any of the subjects fully addressed in the employer's contingency planning required by permits, such as those issued by the United States Environmental Protection Agency, provided that the contingency plan is made part of the emergency response plan. The emergency response plan shall be a written portion of the employer's safety and health program required in this section. Employers who will evacuate their employees from the worksite location when an emergency occurs and who do not permit any of their employees to assist in handling the emergency are exempt from the requirements of WAC 296-62-

3140(8) if they provide an emergency action plan complying with WAC 296-24-567.

(b) Elements of an emergency response plan. The employer shall develop an emergency response plan for emergencies which shall address, as a minimum, the following areas to the extent that they are not addressed in any specific program required in this section:

(i) Preemergency planning and coordination with outside parties.

(ii) Personnel roles, lines of authority, and communication.

(iii) Emergency recognition and prevention.

(iv) Safe distances and places of refuge.

(v) Site security and control.

(vi) Evacuation routes and procedures.

(vii) Decontamination procedures.

(viii) Emergency medical treatment and first aid.

(ix) Emergency alerting and response procedures.

(x) Critique of response and follow-up.

(xi) PPE and emergency equipment.

(c) Training.

(i) Training for emergency response employees shall be completed before they are called upon to perform in real emergencies. Such training shall include the elements of the emergency response plan, standard operating procedures the employer has established for the job, the personal protective equipment to be worn, and procedures for handling emergency incidents.

Exception #1:

An employer need not train all employees to the degree specified if the employer divides the workforce in a manner such that a sufficient number of employees who have responsibility to control emergencies have the training specified, and all other employees, who may first respond to an emergency incident, have sufficient awareness training to recognize that an emergency response situation exists and that they are instructed in that case to summon the fully trained employees and not attempt to control activities for which they are not trained.

Exception #2:

An employer need not train all employees to the degree specified if arrangements have been made in advance for an outside fully trained emergency response team to respond in a reasonable period and all employees, who may come to the incident first, have sufficient awareness training to recognize that an emergency response situation exists and they have been instructed to call the designated outside fully trained emergency response team for assistance.

(ii) Employee members of TSD facility emergency response organizations shall be trained to a level of competence in the recognition of health and safety hazards to protect themselves and other employees. This would include training in the methods used to minimize the risk from safety and health hazards; in the safe use of control equipment; in the selection and use of appropriate personal protective equipment; in the safe operating procedures to be used at the incident scene; in the techniques of coordination with other employees to minimize risks; in the appropriate response to overexposure from health hazards or injury to themselves and other employees; and in the recognition of subsequent symptoms which may result from overexposures.

(iii) The employer shall certify that each covered employee has attended and successfully completed the training required in this subsection, or shall certify the employee's competency at least yearly. The method used to demonstrate

competency for certification of training shall be recorded and maintained by the employer.

(d) Procedures for handling emergency incidents.

(i) In addition to the elements for the emergency response plan required in (b) of this subsection, the following elements shall be included for emergency response plans to the extent that they do not repeat any information already contained in the emergency response plan:

(A) Site topography, layout, and prevailing weather conditions.

(B) Procedures for reporting incidents to local, state, and federal governmental agencies.

(ii) The emergency response plan shall be compatible and integrated with the disaster, fire, and/or emergency response plans of local, state, and federal agencies.

(iii) The emergency response plan shall be rehearsed regularly as part of the overall training program for site operations.

(iv) The site emergency response plan shall be reviewed periodically and, as necessary, be amended to keep it current with new or changing site conditions or information.

(v) An employee alarm system shall be installed in accordance with WAC 296-24-631 to notify employees of an emergency situation; to stop work activities if necessary; to lower background noise in order to speed communication; and to begin emergency procedures.

(vi) Based upon the information available at time of the emergency, the employer shall evaluate the incident and the site response capabilities and proceed with the appropriate steps to implement the site emergency response plan.

[Statutory Authority: Chapter 49.17 RCW. 94-16-145, § 296-62-3140, filed 8/3/94, effective 9/12/94; 91-24-017 (Order 91-07), § 296-62-3140, filed 11/22/91, effective 12/24/91; 90-20-091 (Order 90-14), § 296-62-3140, filed 10/1/90, effective 11/15/90; 89-21-018, § 296-62-3140, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3140, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3152 Appendices to Part P—Hazardous waste operations and emergency response.

Note: The following appendices serve as nonmandatory guidelines to assist employees and employers in complying with the appropriate requirements of this part. However, WAC 296-62-3060 makes mandatory in certain circumstances the use of Level A and Level B personal protective equipment protection.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018, § 296-62-3152, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3152, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3160 Appendix A—Personal protective equipment test methods. This appendix sets forth the nonmandatory examples of tests which may be used to evaluate compliance with WAC 296-62-3060. Other tests and other challenge agents may be used to evaluate compliance.

(1) Totally-encapsulating chemical protective suit pressure test.

(a) Scope.

(i) This practice measures the ability of a gas tight totally-encapsulating chemical protective suit material, seams, and closures to maintain a fixed positive pressure. The results of this practice allow the gas tight integrity of a total-encapsulating chemical protective suit to be evaluated.

(ii) Resistance of the suit materials to permeation, penetration, and degradation by specific hazardous substances is not determined by this test method.

(b) Definition of terms.

(i) "Totally-encapsulated chemical protective suit (TECP suit)" means a full body garment which is constructed of protective clothing materials; covers the wearer's torso, head, arms, and legs; may cover the wearer's hands and feet with tightly attached gloves and boots; completely encloses the wearer and respirator by itself or in combination with the wearer's gloves and boots.

(ii) "Protective clothing material" means any material or combination of materials used in an item of clothing for the purpose of isolating parts of the body from direct contact with a potentially hazardous liquid or gaseous chemicals.

(iii) "Gas tight" means for the purpose of this test method the limited flow of a gas under pressure from the inside of a TECP suit to atmosphere at a prescribed pressure and time interval.

(c) Summary of test method. The TECP suit is visually inspected and modified for the test. The test apparatus is attached to the suit to permit inflation to the pretest suit expansion pressure for removal of suit wrinkles and creases. The pressure is lowered to the test pressure and monitored for three minutes. If the pressure drop is excessive, the TECP suit fails the test and is removed from service. The test is repeated after leak location and repair.

(d) Required supplies.

(i) Source of compressed air.

(ii) Test apparatus for suit testing including a pressure measurement device with a sensitivity of at least 1/4 inch water gauge.

(iii) Vent valve closure plugs or sealing tape.

(iv) Soapy water solution and soft brush.

(v) Stopwatch or appropriate timing device.

(e) Safety precautions. Care shall be taken to provide the correct pressure safety devices required for the source of compressed air used.

(f) Test procedure. Prior to each test, the tester shall perform a visual inspection of the suit. Check the suit for seam integrity by visually examining the seams and gently pulling on the seams. Ensure that all air supply lines, fittings, visor, zippers, and valves are secure and show no signs of deterioration.

(i) Seal off the vent valves along with any other normal inlet or exhaust points (such as umbilical air line fittings or facepiece opening) with tape or other appropriate means (caps, plugs, fixture, etc.). Care should be exercised in the sealing process not to damage any of the suit components.

(ii) Close all closure assemblies.

(iii) Prepare the suit for inflation by providing an improvised connection point on the suit for connecting an airline. Attach the pressure test apparatus to the suit to permit suit inflation from a compressed air source equipped with a pressure indicating regulator. The leak tightness of the pressure test apparatus should be tested before and after each test by closing off the end of the tubing attached to the suit and assuring a pressure of three inches water gauge for three minutes can be maintained. If a component is removed for the test, that component shall be replaced and a second test conducted

with another component removed to permit a complete test of the ensemble.

(iv) The pretest expansion pressure (A) and the suit test pressure (B) shall be supplied by the suit manufacturer, but in no case shall they be less than (A) = 3 inches water gauge and (B) = 2 inches water gauge. The ending suit pressure (C) shall be no less than eighty percent of the test pressure (B); i.e., the pressure drop shall not exceed twenty percent of the test pressure (B).

(v) Inflate the suit until the pressure inside is equal to pressure (A), the pretest expansion suit pressure. Allow at least one minute to fill out the wrinkles in the suit. Release sufficient air to reduce the suit pressure to pressure (B), the suit test pressure. Begin timing. At the end of three minutes, record the suit pressure as pressure (C), the ending suit pressure. The difference between the suit test pressure and the ending suit test pressure (B)-(C) shall be defined as the suit pressure drop.

(vi) If the suit pressure drop is more than twenty percent of the suit test pressure (B) during the three minute test period, the suit fails the test and shall be removed from service.

(g) Retest procedure.

(i) If the suit fails the test check for leaks by inflating the suit to pressure (A) and brushing or wiping the entire suit (including seams, closures, lens gaskets, glove-to-sleeve joints, etc.) with a mild soap and water solution. Observe the suit for the formation of soap bubbles, which is an indication of a leak. Repair all identified leaks.

(ii) Retest the TECP suit as outlined in (f) of this subsection.

(h) Report. Each TECP suit tested by this practice shall have the following information recorded.

(i) Unique identification number, identifying brand name, date of purchase, material of construction, and unique fit features; e.g., special breathing apparatus.

(ii) The actual values for test pressures (A), (B), and (C) shall be recorded along with the specific observation times. If the ending pressure (C) is less than eighty percent of the test pressure (B), the suit shall be identified as failing the test. When possible, the specific leak location shall be identified in the test records. Retest pressure data shall be recorded as an additional test.

(iii) The source of the test apparatus used shall be identified and the sensitivity of the pressure gauge shall be recorded.

(iv) Records shall be kept for each pressure test even if repairs are being made at the test location.

Caution. Visually inspect all parts of the suit to be sure they are positioned correctly and secured tightly before putting the suit back into service. Special care should be taken to examine each exhaust valve to make sure it is not blocked. Care should also be exercised to assure that the inside and outside of the suit is completely dry before it is put into storage.

(2) Totally-encapsulating chemical protective suit qualitative leak test.

(a) Scope.

(i) This practice semiquantitatively tests gas tight totally-encapsulating chemical protective suit integrity by detecting

inward leakage of ammonia vapor. Since no modifications are made to the suit to carry out this test, the results from this practice provide a realistic test for the integrity of the entire suit.

(ii) Resistance of the suit materials to permeation, penetration, and degradation is not determined by this test method. ASTM test methods are available to test suit materials for those characteristics and the tests are usually conducted by the manufacturers of the suits.

(b) Definition of terms.

(i) "Totally-encapsulated chemical protective suit (TECP suit)" means a full body garment which is constructed of protective clothing materials; covers the wearer's torso, head, arms, and legs; may cover the wearer's hands and feet with tightly attached gloves and boots; completely encloses the wearer and respirator by itself or in combination with the wearer's gloves and boots.

(ii) "Protective clothing material" means any material or combination of materials used in an item of clothing for the purpose of isolating parts of the body from direct contact with a potentially hazardous liquid or gaseous chemicals.

(iii) "Gas tight" means for the purpose of this test method the limited flow of a gas under pressure from the inside of a TECP suit to atmosphere at a prescribed pressure and time interval.

(iv) "Intrusion coefficient." A number expressing the level of protection provided by a gas tight totally-encapsulating chemical protective suit. The intrusion coefficient is calculated by dividing the test room challenge agent concentration by the concentration of challenge agent found inside the suit. The accuracy of the intrusion coefficient is dependent on the challenge agent monitoring methods. The larger the intrusion coefficient, the greater the protection provided by the TECP suit.

(c) Summary of recommended practice. The volume of concentrated aqueous ammonia solution (ammonia hydroxide, NH_4OH) required to generate the test atmosphere is determined using the directions outlined in WAC 296-62-3190 (2)(f)(i). The suit is donned by a person wearing the appropriate respiratory equipment (either a positive pressure self-contained breathing apparatus or a supplied air respirator) and worn inside the enclosed test room. The concentrated aqueous ammonia solution is taken by the suited individual into the test room and poured into an open plastic pan. A two-minute evaporation period is observed before the test room concentration is measured using a high range ammonia length of stain detector tube. When the ammonia reaches a concentration of between 1000 and 1200 ppm, the suited individual starts a standardized exercise protocol to stress and flex the suit. After this protocol is completed the test room concentration is measured again. The suited individual exits the test room and his stand-by person measures the ammonia concentration inside the suit using a low range ammonia length of stain detector tube or other more sensitive ammonia detector. A stand-by person is required to observe the test individual during the test procedure, aid the person in donning and doffing the TECP suit and monitor the suit interior. The intrusion coefficient of the suit can be calculated by dividing the average test area concentration by the interior suit concentration. A colorimetric indicator strip of bro-

mophenol blue is placed on the inside of the suit facepiece lens so that the suited individual is able to detect a color change and know if the suit has a significant leak. If a color change is observed the individual should leave the test room immediately.

(d) Required supplies.

(i) A supply of concentrated aqueous ammonium hydroxide, 58% by weight.

(ii) A supply of bromophenol/blue indicating paper, sensitive to 5-10 ppm ammonia or greater over a two-minute period of exposure [pH 3.0 (yellow) to pH 4.6 (blue)].

(iii) A supply of high range (0.5-10 volume percent) and low range (5-700 ppm) detector tubes for ammonia and the corresponding sampling pump. More sensitive ammonia detectors can be substituted for the low range detector tubes to improve the sensitivity of this practice.

(iv) A shallow plastic pan (PVC) at least 12":14":1" and a half pint plastic container (PVC) with tightly closing lid.

(v) A graduated cylinder or other volumetric measuring device of at least fifty milliliters in volume with an accuracy of at least ± 1 milliliters.

(e) Safety precautions.

(i) Concentrated aqueous ammonium hydroxide, NH_4OH is a corrosive volatile liquid requiring eye, skin, and respiratory protection. The person conducting the test shall review the MSDS for aqueous ammonia.

(ii) Since the established permissible exposure limit for ammonia is 35 ppm as a 15 minute STEL, only persons wearing a positive pressure self-contained breathing apparatus or a supplied air respirator shall be in the chamber. Normally only the person wearing the total-encapsulating suit will be inside the chamber. A stand-by person shall have a self-contained breathing apparatus, or a positive pressure supplied air respirator available to enter the test area should the suited individual need assistance.

(iii) A method to monitor the suited individual must be used during this test. Visual contact is the simplest but other methods using communication devices are acceptable.

(iv) The test room shall be large enough to allow the exercise protocol to be carried out and then to be ventilated to allow for easy exhaust of the ammonia test atmosphere after the test(s) are completed.

(v) Individuals shall be medically screened for the use of respiratory protection and checked for allergies to ammonia before participating in this test procedure.

(f) Test procedure.

(i) Measure the test area to the nearest foot and calculate its volume in cubic feet. Multiply the test area volume by 0.2 milliliters of concentrated aqueous ammonia per cubic foot of test area volume to determine the approximate volume of concentrated aqueous ammonia required to generate 1000 ppm in the test area.

(A) Measure this volume from the supply of concentrated ammonia and place it into a closed plastic container.

(B) Place the container, several high range ammonia detector tubes and the pump in the clean test pan and locate it near the test area entry door so that the suited individual has easy access to these supplies.

(ii) In a noncontaminated atmosphere, open a presealed ammonia indicator strip and fasten one end of the strip to the

inside of the suit face shield lens where it can be seen by the wearer. Moisten the indicator strip with distilled water. Care shall be taken not to contaminate the detector part of the indicator paper by touching it. A small piece of masking tape or equivalent should be used to attach the indicator strip to the interior of the suit face shield.

(iii) If problems are encountered with this method of attachment the indicator strip can be attached to the outside of the respirator facepiece being used during the test.

(iv) Don the respiratory protective device normally used with the suit, and then don the TECP suit to be tested. Check to be sure all openings which are intended to be sealed (zippers, gloves, etc.) are completely sealed. DO NOT, however, plug off any venting valves.

(v) Step into the enclosed test room such as a closet, bathroom, or test booth, equipped with an exhaust fan. No air should be exhausted from the chamber during the test because this will dilute the ammonia challenge concentrations.

(vi) Open the container with the premeasured volume of concentrated aqueous ammonia within the enclosed test room, and pour the liquid into the empty plastic test pan. Wait two minutes to allow for adequate volatilization of the concentrated aqueous ammonia. A small mixing fan can be used near the evaporation pan to increase the evaporation rate of the ammonia solution.

(vii) After two minutes a determination of the ammonia concentration within the chamber should be made using the high range colorimetric detector tube. A concentration of 1000 ppm ammonia or greater shall be generated before the exercises are started.

(viii) To test the integrity of the suit the following four minute exercise protocol should be followed:

(A) Raising the arms above the head with at least fifteen raising motions completed in one minute.

(B) Walking in place for one minute with at least fifteen raising motions of each leg in a one-minute period.

(C) Touching the toes with at least ten complete motions of the arms from above the head to touching of the toes in a one-minute period.

(D) Knee bends with at least ten complete standing and squatting motions in a one-minute period.

(ix) If at any time during the test the colorimetric indicating paper should change colors the test should be stopped and (f)(x) and (xi) of this subsection initiated.

(x) After completion of the test exercise, the test area concentration should be measured again using the high range colorimetric detector tube.

(xi) Exit the test area.

(xii) The opening created by the suit zipper or other appropriate suit penetration should be used to determine the ammonia concentration in the suit with the low range length of stain detector tube or other ammonia monitor. The internal TECP suit air should be sampled far enough from the enclosed test area to prevent a false ammonia reading.

(xiii) After completion of the measurement of the suit interior ammonia concentration the test is concluded and the suit is doffed and the respirator removed.

(xiv) The ventilating fan for the test room should be turned on and allowed to run for enough time to remove the

ammonia gas. The fan shall be vented to the outside of the building.

(xv) Any detectable ammonia in the suit interior (5 ppm ammonia (NH₃) or more for the length of stain detector tube) indicates the suit failed the test. When other ammonia detectors are used, a lower level of detection is possible and it should be specified as the pass/fail criteria.

(xvi) By following this test method an intrusion coefficient of approximately two hundred or more can be measured with the suit in a completely operational condition. If the intrusion coefficient is 200 or more, then the suit is suitable for emergency response and field use.

(g) Retest procedures.

(i) If the suit fails this test, check for leaks by following the pressure test in test (A) above.

(ii) Retest the TECP suit as outlined in the test procedure in (f) of this subsection.

(h) Report.

(i) Each gas tight totally-encapsulating chemical protective suit tested by this practice shall have the following information recorded.

(A) Unique identification number, identifying brand name, date of purchase, material of construction, and unique suit features; e.g., special breathing apparatus.

(B) General description of test room used for test.

(C) Brand name and purchase date of ammonia detector strips and color change data.

(D) Brand name, sampling range, and expiration date of the length of stain ammonia detector tubes. The brand name and model of the sampling pump should also be recorded. If another type of ammonia detector is used, it should be identified along with its minimum detection limit for ammonia.

(E) Actual test results shall list the two test area concentrations, their average, the interior suit concentration, and the calculated intrusion coefficient. Retest data shall be recorded as an additional test.

(ii) The evaluation of the data shall be specified as "suit passed" or "suit failed" and the date of the test. Any detectable ammonia (5 ppm or greater for the length of stain detector tube) in the suit interior indicates the suit fails this test. When other ammonia detectors are used, a lower level of detection is possible and it should be specified as the pass/fail criteria.

Caution. Visually inspect all parts of the suit to be sure they are positioned correctly and secured tightly before putting the suit back into service. Special care should be taken to examine each exhaust valve to make sure it is not blocked.

Care should also be exercised to assure that the inside and outside of the suit is completely dry before it is put into storage.

[Statutory Authority: Chapter 49.17 RCW, 91-24-017 (Order 91-07), § 296-62-3160, filed 11/22/91, effective 12/24/91; 90-20-091 (Order 90-14), § 296-62-3160, filed 10/1/90, effective 11/15/90; 89-21-018, § 296-62-3160, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3160, filed 10/6/88, effective 11/7/88.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

WAC 296-62-3170 Appendix B—General description and discussion of the levels of protection and protective gear. (1) This appendix sets forth information about personal

protective equipment (PPE) protection levels which may be used to assist employers in complying with the PPE requirements of this section.

(2) As required by the standard, PPE must be selected which will protect employees from the specific hazards which they are likely to encounter during their work on-site.

(3) Selection of the appropriate PPE is a complex process which must take into consideration a variety of factors. Key factors involved in this process are identification of the hazards or suspected hazards, their routes of potential hazard to employees (inhalation, skin absorption, ingestion, and eye or skin contact), and the performance of the PPE materials (and seams) in providing a barrier to these hazards. The amount of protection provided by PPE is material-hazard specific. That is, protective equipment materials will protect well against some hazardous substances and poorly, or not at all, against others. In many instances, protective equipment materials cannot be found which will provide continuous protection from the particular hazardous substance. In these cases the breakthrough time of the protective material should exceed the work durations.

(4) Other factors in this selection process to be considered are matching the PPE to the employee's work requirements and task-specific conditions. The durability of PPE materials, such as tear strength and seam strength, must be considered in relation to the employee's tasks. The effects of PPE in relation to heat stress and task duration are a factor in selecting and using PPE. In some cases layers of PPE may be necessary to provide sufficient protection, or to protect expensive PPE inner garments, suits or equipment.

(5) The more that is known about the hazards at the site, the easier the job of PPE selection becomes. As more information about the hazards and conditions at the site becomes available, the site supervisor can make decisions to up-grade or down-grade the level of PPE protection to match the tasks at hand.

(6) The following are guidelines which an employer can use to begin the selection of the appropriate PPE. As noted above, the site information may suggest the use of combinations of PPE selected from the different protection levels (i.e., A, B, C, or D) as being more suitable to the hazards of the work. It should be cautioned that the listing below does not fully address the performance of the specific PPE material in relation to the specific hazards at the job site, and that PPE selection, evaluation and reselection is an ongoing process until sufficient information about the hazards and PPE performance is obtained.

(7) Personal protective equipment has been divided into four categories based on the degree of protection afforded (see subsection (8) of this section for further explanation of Levels A, B, C, and D hazards):

(a) Level A. To be selected when the greatest level of skin, respiratory, and eye protection is required. The following constitute Level A equipment; it may be used as appropriate:

(i) Positive pressure, full-facepiece self-contained breathing apparatus (SCBA), or positive pressure supplied-air respirator with escape SCBA, approved by the National Institute for Occupational Safety and Health (NIOSH).

(ii) Totally-encapsulating chemical-protective suit.

(iii) Coveralls.*

(iv) Long underwear.*

(v) Gloves, outer, chemical-resistant.

(vi) Gloves, inner, chemical-resistant.

(vii) Boots, chemical-resistant steel toe and shank.

(viii) Hard hat (under suit).*

(ix) Disposable protective suit, gloves, and boots. (Depending on suit construction, may be worn over totally-encapsulating suit.)

* Optional, as applicable.

(b) Level B. The highest level of respiratory protection is necessary but a lesser level of skin protection is needed. The following constitute Level B equipment; it may be used as appropriate:

(i) Positive pressure, full-facepiece self-contained breathing apparatus (SCBA), or positive pressure supplied-air respirator with escape SCBA (NIOSH approved).

(ii) Hooded chemical-resistant clothing (overalls and long-sleeved jacket, coveralls, one or two-piece chemical-splash suit, disposable chemical-resistant overalls).

(iii) Coveralls.*

(iv) Gloves, outer, chemical-resistant.

(v) Gloves, inner, chemical-resistant.

(vi) Boots, outer, chemical-resistant steel toe and shank.

(vii) Boot-covers, outer, chemical-resistant (disposable).*

(viii) Hard hat.

(ix) Face shield.*

* Optional, as applicable.

(c) Level C. The concentration(s) and type(s) of airborne substance(s) is known and the criteria for using air purifying respirators are met. The following constitute Level C equipment; it may be used as appropriate.

(i) Full-face or half-mask, air purifying respirators (NIOSH approved).

(ii) Hooded chemical-resistant clothing (overalls; two-piece chemical-splash suit; disposable chemical-resistant overalls).

(iii) Coveralls.*

(iv) Gloves, outer, chemical-resistant.

(v) Gloves, inner, chemical-resistant.

(vi) Boots (outer), chemical-resistant steel toe and shank.*

(vii) Boot-covers, outer, chemical-resistant (disposable).*

(viii) Hard hat.

(ix) Escape mask.*

(x) Face shield.*

* Optional, as applicable.

(d) Level D. A work uniform affording minimal protection: Used for nuisance contamination only. The following constitute Level D equipment; it may be used as appropriate.

(i) Coveralls.

(ii) Gloves.*

(iii) Boots/shoes, chemical-resistant steel toe and shank.

(iv) Boots, outer, chemical-resistant (disposable).*

(v) Safety glasses or chemical splash goggles.*

(vi) Hard hat.

- (vii) Escape mask.*
- (viii) Face shield.*

* Optional, as applicable.

(8) Part B. The types of hazards for which Levels A, B, C, and D protection are appropriate are described below:

(a) Level A - Level A protection should be used when:

(i) The hazardous substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on either the measured (or potential for) high concentration of atmospheric vapors, gases, or particulates; or the site operations and work functions involve a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates of materials that are harmful to skin or capable of being absorbed through the intact skin;

(ii) Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible; or

(iii) Operations are being conducted in confined, poorly ventilated areas, and the absence of conditions requiring Level A have not yet been determined.

(b) Level B protection should be used when:

(i) The type and atmospheric concentration of substances have been identified and require a high level of respiratory protection, but less skin protection;

(ii) The atmosphere contains less than 19.5 percent oxygen; or

(iii) The presence of incompletely identified vapors or gases is indicated by a direct-reading organic vapor detection instrument, but vapors and gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through the skin.

Note: This involves atmospheres with IDLH concentrations of specific substances that present severe inhalation hazards and that do not represent a severe skin hazard; or that do not meet the criteria for use of air-purifying respirators.

(c) Level C protection should be used when:

(i) The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect or be absorbed through any exposed skin;

(ii) The types of air contaminants have been identified, concentrations measured, and an air-purifying respirator is available that can remove the contaminants; and

(iii) All criteria for the use of air-purifying respirators are met.

(d) Level D protection should be used when:

(i) The atmosphere contains no known hazard; and

(ii) Work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals.

Note: As stated before combinations of personal protective equipment other than those described for Levels A, B, C, and D protection may be more appropriate and may be used to provide the proper level of protection.

(9) As an aid in selecting suitable chemical protective clothing, it should be noted that the National Fire Protection Association (NFPA) has developed standards on chemical protective clothing. The standards that have been adopted include:

(a) NFPA 1991 - Standard on Vapor-Protective Suits for Hazardous Chemical Emergencies (EPA Level A Protective Clothing);

(b) NFPA 1992 - Standard on Liquid Splash-Protective Suits for Hazardous Chemical Emergencies (EPA Level B Protective Clothing);

(c) NFPA 1993 - Standard on Liquid Splash-Protective Suits for Nonemergency, Nonflammable Hazardous Chemical Situations (EPA Level B Protective Clothing).

(10) These standards apply documentation and performance requirements to the manufacture of chemical protective suits. Chemical protective suits meeting these requirements are labelled as compliant with the appropriate standard. It is recommended that chemical protective suits that meet these standards be used.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-62-3170, filed 1/18/95, effective 3/10/95; 90-20-091 (Order 90-14), § 296-62-3170, filed 10/1/90, effective 11/15/90; 89-21-018, § 296-62-3170, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3170, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3180 Appendix C—Compliance guidelines. (1) Occupational safety and health program. Each hazardous waste site clean-up effort will require an occupational safety and health program headed by the site coordinator or the employer's representative. The purpose of the program will be the protection of employees at the site and will be an extension of the employer's overall safety and health program. The program will need to be developed before work begins on the site and implemented as work proceeds as stated in WAC 296-62-3010. The program is to facilitate coordination and communication of safety and health issues among personnel responsible for the various activities which will take place at the site. It will provide the overall means for planning and implementing the needed safety and health training and job orientation of employees who will be working at the site. The program will provide the means for identifying and controlling worksite hazards and the means for monitoring program effectiveness. The program will need to cover the responsibilities and authority of the site coordinator or the employer's manager on the site for the safety and health of employees at the site, and the relationships with contractors or support services as to what each employer's safety and health responsibilities are for their employees on the site. Each contractor on the site needs to have its own safety and health program so structured that it will smoothly interface with the program of the site coordinator or principal contractor. Also those employers involved with treating, storing, or disposal of hazardous waste as covered in WAC 296-62-3140 must have implemented a safety and health plan for their employees. This program is to include the hazard communication program required in WAC 296-62-3140(1) and the training required in WAC 296-62-3140 (4) and (5) as parts of the employers comprehensive overall safety and health program. This program is to be in writing.

(a) Each site or workplace safety and health program will need to include the following:

(i) Policy statements of the line of authority and accountability for implementing the program, the objectives of the program and the role of the site safety and health officer or manager and staff;

(ii) Means or methods for the development of procedures for identifying and controlling workplace hazards at the site;

(iii) Means or methods for the development and communication to employees of the various plans, work rules, standard operating procedures and practices that pertain to individual employees and supervisors;

(iv) Means for the training of supervisors and employees to develop the needed skills and knowledge to perform their work in a safe and healthful manner;

(v) Means to anticipate and prepare for emergency situations; and

(vi) Means for obtaining information feedback to aid in evaluating the program and for improving the effectiveness of the program. The management and employees should be trying continually to improve the effectiveness of the program thereby enhancing the protection being afforded those working on the site.

(b) Accidents on the site should be investigated to provide information on how such occurrences can be avoided in the future. When injuries or illnesses occur on the site or workplace, they will need to be investigated to determine what needs to be done to prevent this incident from occurring again. Such information will need to be used as feedback on the effectiveness of the program and the information turned into positive steps to prevent any reoccurrence. Receipt of employee suggestions or complaints relating to safety and health issues involved with site or workplace activities is also a feedback mechanism that can be used effectively to improve the program and may serve in part as an evaluative tool(s).

(c) For the development and implementation of the program to be the most effective, professional safety and health personnel should be used. Certified safety professionals, board-certified industrial hygienists, or registered professional safety engineers are good examples of professional stature for safety and health managers who will administer the employer's program.

(2) The training programs for employees subject to the requirements of WAC 296-62-3040 are expected to address: The safety and health hazards employees should expect to find on sites; what control measures or techniques are effective for those hazards; what monitoring procedures are effective in characterizing exposure levels; what makes an effective employer's safety and health program; what a site safety and health plan should include; hands-on training with personal protective equipment and clothing they may be expected to use; the contents of the WISHA standard relevant to the employee's duties and functions; and, employee's responsibilities under WISHA and other regulations. Supervisors will need training in their responsibilities under the safety and health program and its subject areas such as the spill containment program, the personal protective equipment program, the medical surveillance program, the emergency response plan and other areas.

(a) The training programs for employees subject to the requirements of WAC 296-62-3140 should address: The employer's safety and health program elements impacting employees; the hazard communication program; the medical surveillance program; the hazards and the controls for such

hazards that employees need to know for their job duties and functions. All require annual refresher training.

(b) The training programs for employees covered by the requirements of WAC 296-62-3110(3) will address those competencies required for the various levels of response such as: The hazards associated with hazardous substances; hazard identification and awareness; notification of appropriate persons; the need for and use of personal protective equipment including respirators; the decontamination procedures to be used; preplanning activities for hazardous substance incidents including the emergency response plan; company standard operating procedures for hazardous substance emergency responses; the use of the incident command system and other subjects. Hands-on training should be stressed whenever possible. Critiques done after an incident which include any evaluation of what worked, and what did not, and how can we do better the next time, may be counted as training time.

(c) For hazardous materials specialists (usually members of hazardous materials teams), the training will need to address the care, use and/or testing of chemical protective clothing including totally encapsulating suits, the medical surveillance program, the standard operating procedures for the hazardous materials team including the use of plugging and patching equipment and other subject areas.

(d) Officers and leaders who may be expected to be in charge at an incident will need to be fully knowledgeable of their company's incident command system. They will need to know where and how to obtain additional assistance and be familiar with the local district's emergency response plan and the state emergency response plan.

(e) Specialist employees such as technical experts, medical experts, or environmental experts that work with hazardous materials in their regular jobs, who may be sent to the incident scene by the shipper, manufacturer or governmental agency to advise and assist the person in charge of the incident will have training on an annual basis. Their training must include the care and use of personal protective equipment including respirators; knowledge of the incident command system and how they are to relate to it; and those areas needed to keep them current in their respective field as it relates to safety and health involving specific hazardous substances.

(f) Those skilled support personnel, such as employees who work for public works departments or equipment operators who operate bulldozers, sand trucks, backhoes, etc., who may be called to the incident scene to provide emergency support assistance, will need to have at least a safety and health briefing before entering the area of potential or actual exposure. These specially skilled support personnel, who have not been a part of the emergency plan and do not meet the training requirements, must be made aware of the hazards they face and be provided all necessary protective clothing and equipment required for their tasks.

(g) There are two National Fire Protection Association standards, NFPA 472—"Standard for Professional Competence of Responders to Hazardous Material Incidents" and NFPA 471—"Recommended Practice for Responding to Hazardous Material Incidents," which are excellent resource documents to aid fire departments and other emergency

response organizations in developing their training program materials. NFPA 472 provides guidance on the skills and knowledge needed for first responder awareness level, first responder operations level, hazmat technicians, and hazmat specialist. It also offers guidance for the officer corp who will be in charge of hazardous substance incidents.

(3) Decontamination. Decontamination procedures will be tailored to the specific hazards of the site and will vary in complexity, and number of steps, depending on the level of hazard and the employee's exposure to the hazard. Decontamination procedures and PPE decontamination methods will vary depending upon the specific substance, since one procedure or method will not work for all substances. Evaluation of decontamination methods and procedures should be performed, as necessary, to assure that employees are not exposed to hazards by reusing PPE. References in WAC 296-62-3190, Appendix D, may be used for guidance in establishing an effective decontamination program. In addition, the United States Coast Guard Manual, "Policy Guidance for Response to Hazardous Chemical Releases," United States Department of Transportation, Washington, D.C. (COM-DTINST M16465.30), is a good reference for establishing an effective decontamination program.

(4) Emergency response plans. States, along with designated districts within the states, will be developing or have developed emergency response plans. These state and district plans are to be utilized in the emergency response plans called for in this standard. Each employer needs to assure that its emergency response plan is compatible with the local plan. The major reference being used to aid in developing the state and local district plans is the Hazardous Materials Emergency Planning Guide, NRT-1. The current Emergency Response Guidebook from the United States Department of Transportation, CMA's CHEMTREC and the Fire Service Emergency Management Handbook may also be used as resources.

Employers involved with treatment, storage, and disposal facilities for hazardous waste, which have the required contingency plan called for by their permit, would not need to duplicate the same planning elements. Those items of the emergency response plan that are properly addressed in the contingency plan may be substituted into the emergency response plan required in WAC 296-62-3112 or otherwise kept together for employer and employee use.

(5) Personal protective equipment programs. The purpose of personal protective clothing and equipment (PPE) is to shield or isolate individuals from the chemical, physical, and biologic hazards that may be encountered at a hazardous substance site.

(a) As discussed in Appendix B, no single combination of protective equipment and clothing is capable of protecting against all hazards. Thus PPE should be used in conjunction with other protective methods and its effectiveness evaluated periodically.

(b) The use of PPE can itself create significant worker hazards, such as heat stress, physical and psychological stress, and impaired vision, mobility, and communication. For any given situation, equipment and clothing will be selected that provide an adequate level of protection. How-

ever, over-protection, as well as under-protection, can be hazardous and should be avoided where possible.

(c) Two basic objectives of any PPE program will be to protect the wearer from safety and health hazards, and to prevent injury to the wearer from incorrect use and/or malfunction of the PPE. To accomplish these goals, a comprehensive PPE program will include hazard identification, medical monitoring, environmental surveillance, selection, use, maintenance, and decontamination of PPE and its associated training.

(d) The written PPE program will include policy statements, procedures, and guidelines. Copies will be made available to all employees and a reference copy will be made available at the worksite. Technical data on equipment, maintenance manuals, relevant regulations, and other essential information will also be collected and maintained.

(6) Incident command system (ICS). WAC 296-62-3112 (3)(b) requires the implementation of an ICS. The ICS is an organized approach to effectively control and manage operations at an emergency incident. The individual in charge of the ICS is the senior official responding to the incident. The ICS is not much different than the "command post" approach used for many years by the fire service. During large complex fires involving several companies and many pieces of apparatus, a command post would be established. This enables one individual to be in charge of managing the incident, rather than having several officers from different companies making separate, and sometimes conflicting, decisions. The individual in charge of the command post would delegate responsibility for performing various tasks to subordinate officers. Additionally, all communications were routed through the command post to reduce the number of radio transmissions and eliminate confusion. However, strategy, tactics, and all decisions were made by one individual.

(a) The ICS is a very similar system, except it is implemented for emergency response to all incidents, both large and small, that involve hazardous substances.

(b) For a small incident, the individual in charge of the ICS may perform many tasks of the ICS. There may not be any, or little, delegation of tasks to subordinates. For example, in response to a small incident, the individual in charge of the ICS, in addition to normal command activities, may become the safety officer and may designate only one employee (with proper equipment) as a back-up to provide assistance if needed. WISHA does recommend, however, that at least two employees be designated as back-up personnel since the assistance needed may include rescue.

(c) To illustrate the operation of the ICS, the following scenario might develop during a small incident, such as an overturned tank truck with a small leak of flammable liquid.

(d) The first responding senior officer would implement and take command of the ICS. That person would size-up the incident and determine if additional personnel and apparatus were necessary; would determine what actions to take to control the leak; and, determine the proper level of personal protective equipment. If additional assistance is not needed, the individual in charge of the ICS would implement actions to stop and control the leak using the fewest number of personnel that can effectively accomplish the tasks. The individual in charge of the ICS then would designate him or herself as

the safety officer and two other employees as a back-up in case rescue may become necessary. In this scenario, decontamination procedures would not be necessary.

(e) A large complex incident may require many employees and difficult, time-consuming efforts to control. In these situations, the individual in charge of the ICS will want to delegate different tasks to subordinates in order to maintain a span of control that will keep the number of subordinates, that are reporting, to a manageable level.

(f) Delegation of tasks at large incidents may be by location, where the incident scene is divided into sectors, and subordinate officers coordinate activities within the sector that they have been assigned.

(g) Delegation of tasks can also be by function. Some of the functions that the individual in charge of the ICS may want to delegate at a large incident are: Medical services; evacuation; water supply; resources (equipment, apparatus); media relations; safety; and, site control (integrate activities with police for crowd and traffic control). Also for a large incident, the individual in charge of the ICS will designate several employees as back-up personnel; and a number of safety officers to monitor conditions and recommend safety precautions.

(h) Therefore, no matter what size or complexity an incident may be, by implementing an ICS there will be one individual in charge who makes the decisions and gives directions; and, all actions and communications are coordinated through one central point of command. Such a system should reduce confusion, improve safety, organize and coordinate actions, and should facilitate effective management of the incident.

(7) Site safety and control plans.

(a) The safety and security of response personnel and others in the area of an emergency response incident site should be of primary concern to the incident commander. The use of a site safety and control plan could greatly assist those in charge of assuring the safety and health of employees on the site.

(b) A comprehensive site safety and control plan should include the following: Summary analysis of hazards on the site and a risk analysis of those hazards; site map or sketch; site work zones (clean zone, transition or decontamination zone, work or hot zone); use of the buddy system; site communications; command post or command center; standard operating procedures and safe work practices; medical assistance and triage area; hazard monitoring plan (air contaminant monitoring, etc.); decontamination procedures and area; and other relevant areas. This plan should be a part of the employer's emergency response plan or an extension of it to the specific site.

(8) Medical surveillance programs.

(a) Workers handling hazardous substances may be exposed to toxic chemicals, safety hazards, biologic hazards, and radiation. Therefore, a medical surveillance program is essential to assess and monitor workers' health and fitness for employment in hazardous waste operations and during the course of work; to provide emergency and other treatment as needed; and to keep accurate records for future reference.

(b) *The Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* developed by the

(1999 Ed.)

National Institute for Occupational Safety and Health (NIOSH), the Occupational Safety and Health Administration (OSHA), the United States Coast Guard (USCG), and the Environmental Protection Agency (EPA); October 1985 provides an excellent example of the types of medical testing that should be done as part of a medical surveillance program.

(9) New technology and spill containment programs. Where hazardous substances may be released by spilling from a container that will expose employees to the hazards of the materials, the employer will need to implement a program to contain and control the spilled material. Diking and ditching, as well as use of absorbents like diatomaceous earth, are traditional techniques which have proven to be effective over the years. However, in recent years new products have come into the marketplace, the use of which complement and increase the effectiveness of these traditional methods. These new products also provide emergency responders and others with additional tools or agents to use to reduce the hazards of spilled materials.

These agents can be rapidly applied over a large area and can be uniformly applied or otherwise can be used to build a small dam, thus improving the workers' ability to control spilled material. These application techniques enhance the intimate contact between the agent and the spilled material allowing for the quickest effect by the agent or quickest control of the spilled material. Agents are available to solidify liquid spilled materials, to suppress vapor generation from spilled materials, and to do both. Some special agents, which when applied as recommended by the manufacturer, will react in a controlled manner with the spilled material to neutralize acids or caustics, or greatly reduce the level of hazard of the spilled material.

There are several modern methods and devices for use by emergency response personnel or others involved with spill control efforts to safely apply spill control agents to control spilled material hazards. These include portable pressurized applicators similar to hand-held portable fire extinguishing devices, and nozzle and hose systems similar to portable fire fighting foam systems which allow the operator to apply the agent without having to come into contact with the spilled material. The operator is able to apply the agent to the spilled material from a remote position.

The solidification of liquids provides for rapid containment and isolation of hazardous substance spills. By directing the agent at run-off points or at the edges of the spill, the reactant solid will automatically create a barrier to slow or stop the spread of the material. Clean-up of hazardous substances as greatly improved when solidifying agents, acid or caustic neutralizers, or activated carbon absorbents are used. Properly applied, these agents can totally solidify liquid hazardous substances or neutralize or absorb them, which results in materials which are less hazardous and easier to handle, transport, and dispose of. The concept of spill treatment, to create less hazardous substances, will improve the safety and level of protection of employees working at spill clean-up operations or emergency response operations to spills of hazardous substances.

The use of vapor suppression agents for volatile hazardous substances, such as flammable liquids and those sub-

stances which present an inhalation hazard, is important for protecting workers. The rapid and uniform distribution of the agent over the surface of the spilled material can provide quick vapor knockdown. There are temporary and long-term foam-type agents which are effective on vapors and dusts, and activated carbon adsorption agents which are effective for vapor control and soaking-up of the liquid. The proper use of hose lines or hand-held portable pressurized applicators provides good mobility and permits the worker to deliver the agent from a safe distance without having to step into the untreated spilled material. Some of these systems can be recharged in the field to provide coverage of larger spill areas than the design limits of a single charged applicator unit. Some of the more effective agents can solidify the liquid flammable hazardous substances and at the same time elevate the flashpoint above 140 deg. F so the resulting substance may be handled as a nonhazardous waste material if it meets the United States Environmental Protection Agency's 40 CFR part 261 requirements (see particularly Sec. 261.21).

All workers performing hazardous substance spill control work are expected to wear the proper protective clothing and equipment for the materials present and to follow the employer's established standard operating procedures for spill control. All involved workers need to be trained in the established operating procedures; in the use and care of spill control equipment; and in the associated hazards and control of such hazards of spill containment work.

These new tools and agents are the things that employers will want to evaluate as part of their new technology program. The treatment of spills of hazardous substances or wastes at an emergency incident as part of the immediate spill containment and control efforts is sometimes acceptable to EPA and a permit exception is described in 40 CFR 264.1 (g)(8) and 265.1 (c)(11).

[Statutory Authority: Chapter 49.17 RCW, 90-20-091 (Order 90-14), § 296-62-3180, filed 10/1/90, effective 11/15/90; 89-21-018 (Order 89-10), § 296-62-3180, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3180, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3190 Appendix D—References. The following references may be consulted for further information on the subject of this notice:

- (1) *OSHA Instruction DFO CPL 2.70 - January 29, 1986, Special Emphasis Program: Hazardous Waste Sites.*
- (2) *OSHA Instruction DFO CPL 2-2.37A - January 29, 1986, Technical Assistance and Guidelines for Superfund and Other Hazardous Waste Site Activities.*
- (3) *OSHA Instruction DTS CPL 2.74 - January 29, 1986, Hazardous Waste Activity Form, OSHA 175.*
- (4) *Hazardous Waste Inspections Reference Manual, U.S. Department of Labor, Occupational Safety and Health Administration, 1986.*
- (5) *Memorandum of Understanding Among the National Institute for Occupational Safety and Health, the Occupational Safety and Health Administration, the United States Coast Guard, and the United States Environmental Protection Agency; Guidance for Worker Protection During Hazardous Waste Site Investigations and Clean-up and Hazardous Substance Emergencies; December 18, 1980.*
- (6) *National Priorities List, 1st Edition, October 1984; U.S. Environmental Protection Agency, Revised periodically.*

(7) *The Decontamination of Response Personnel, Field Standard Operating Procedures (F.S.O.P.) 7; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, December 1984.*

(8) *Preparation of a Site Safety Plan, Field Standard Operating Procedures (F.S.O.P.) 9; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, April 1985.*

(9) *Standard Operating Safety Guidelines; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, Environmental Response Team; November 1984.*

(10) *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, National Institute for Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), U.S. Coast Guard (USCG), and Environmental Protection Agency (EPA); October 1985.*

(11) *Protecting Health and Safety at Hazardous Waste Sites: An Overview, U.S. Environmental Protection Agency, EPA/625/9-85/006; September 1985.*

(12) *Hazardous Waste Sites and Hazardous Substance Emergencies, NIOSH Worker Bulletin, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; December 1982.*

(13) *Personal Protective Equipment for Hazardous Materials Incidents: A Selection Guide; U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; October 1984.*

(14) *Fire Service Emergency Management Handbook, International Association of Fire Chiefs Foundation, 101 East Holly Avenue, Unit 10B, Sterling, VA 22170, January 1985.*

(15) *Emergency Response Guidebook, U.S. Department of Transportation, Washington, D.C., 1987.*

(16) *Report to the Congress on Hazardous Materials Training, Planning and Preparedness, Federal Emergency Management Agency, Washington, D.C., July 1986.*

(17) *Workbook for Fire Command, Alan V. Brunacini and J. David Beageron, National Fire Protection Association, Batterymarch Park, Quincy, MA 02269, 1985.*

(18) *Fire Command, Alan V. Brunacini, National Fire Protection Association, Batterymarch Park, Quincy, MA 02269, 1985.*

(19) *Incident Command System, Fire Protection Publications, Oklahoma State University, Stillwater, OK 74078, 1983.*

(20) *Site Emergency Response Planning, Chemical Manufacturers Association, Washington, D.C. 20037, 1986.*

(21) *Hazardous Materials Emergency Planning Guide, NRT-1, Environmental Protection Agency, Washington, D.C., March 1987.*

(22) *Community Teamwork: Working Together to Promote Hazardous Materials Transportation Safety. U.S. Department of Transportation, Washington, D.C., May 1983.*

(23) *Disaster Planning Guide for Business and Industry, Federal Emergency Management Agency, Publication No. FEMA 141, August 1987.*

[Statutory Authority: Chapter 49.17 RCW. 90-20-091 (Order 90-14), § 296-62-3190, filed 10/1/90, effective 11/15/90; 89-21-018 (Order 89-10), § 296-62-3190, filed 10/10/89, effective 11/24/89; 88-21-002 (Order 88-23), § 296-62-3190, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3195 Appendix E—Training curriculum guidelines. The following nonmandatory general criteria may be used for assistance in developing site-specific training curriculum used to meet the training requirements of WAC 296-62-3040, 296-62-3140(7), 296-62-3140 (8)(c), 296-62-3112(6), and 296-62-3112(7).

These are generic guidelines and they are not presented as a complete training curriculum for any specific employer. Site-specific training programs must be developed on the basis of a needs assessment of the hazardous waste site, RCRA/TSD, or emergency response operation in accordance with this chapter (chapter 296-62 WAC, Part P).

The guidance set forth here presents a highly effective program that in the areas covered would meet or exceed the regulatory requirements. In addition, other approaches could meet the regulatory requirements.

Suggested general criteria:

Definitions:

"Competent" means possessing the skills, knowledge, experience, and judgment to perform assigned tasks or activities satisfactorily as determined by the employer.

"Demonstration" means the showing by actual use of equipment or procedures.

"Hands-on training" means training in a simulated work environment that permits each student to have experience performing tasks, making decisions, or using equipment appropriate to the job assignment for which the training is being conducted.

"Initial training" means training required prior to beginning work.

"Lecture" means an interactive discourse with a class lead by an instructor.

"Proficient" means meeting a stated level of achievement.

"Site-specific" means individual training directed to the operations of a specific job site.

"Training hours" means the number of hours devoted to lecture, learning activities, small group work sessions, demonstration, evaluations, or hands-on experience.

Suggested core criteria:

(1) Training facility. The training facility should have available sufficient resources, equipment, and site locations to perform concise and hands-on training when appropriate. Training facilities should have sufficient organization, support staff, and services to conduct training in each of the courses offered.

(2) Training director. Each training program should be under the direction of a training director who is responsible for the program. The training director should have a minimum of two years of employee education experience.

(3) Instructors. Instructors should be deemed competent on the basis of previous documented experience in their area of instruction, successful completion of a "train-the-trainer"

program specific to the topics they will teach, and an evaluation of instructional competence by the training director.

(a) Instructors should be required to maintain professional competency by participating in continuing education or professional development programs or by successfully completing an annual refresher course and having an annual review by the training director.

(b) The annual review by the training director should include observation of an instructor's delivery, a review of those observations with the trainer, and an analysis of any instructor or class evaluations completed by the students during the previous year.

(4) Course materials. The training director should approve all course materials to be used by the training provider. Course materials should be reviewed and updated at least annually. Materials and equipment should be in good working order and maintained properly.

(a) All written and audio-visual materials in training curricula should be peer reviewed by technically competent outside reviewers or by a standing advisory committee.

(b) Reviewers should possess expertise in the following disciplines were applicable: Occupational health, industrial hygiene and safety, chemical/environmental engineering, employee education, or emergency response. One or more of the peer reviewers should be an employee experienced in the work activities to which the training is directed.

(5) Students. The program for accepting students should include:

(a) Assurance that the student is or will be involved in work where chemical exposures are likely and that the student possesses the skills necessary to perform the work.

(b) A policy on the necessary medical clearance.

(6) Ratios. Student-instructor ratios should not exceed thirty students per instructor. Hands-on activity requiring the use of personal protective equipment should have the following student-instructor ratios: For Level C or Level D personal protective equipment the ratio should be ten students per instructor. For Level A or Level B personal protective equipment the ratio should be five students per instructor.

(7) Proficiency assessment. Proficiency should be evaluated and documented by the use of a written assessment and a skill demonstration selected and developed by the training director and training staff. The assessment and demonstration should evaluate the knowledge and individual skills developed in the course of training. The level of minimum achievement necessary for proficiency shall be specified in writing by the training director.

(a) If a written test is used, there should be a minimum of fifty questions. If a written test is used in combination with a skills demonstration, a minimum of twenty-five questions should be used. If a skills demonstration is used, the tasks chosen and the means to rate successful completion should be fully documented by the training director.

(b) The content of the written test or of the skill demonstration shall be relevant to the objectives of the course.

The written test and skill demonstration should be updated as necessary to reflect changes in the curriculum and any update should be approved by the training director.

(c) The proficiency assessment methods, regardless of the approach or combination of approaches used, should be justified, documented and approved by the training director.

(d) The proficiency of those taking the additional courses for supervisors should be evaluated and documented by using proficiency assessment methods acceptable to the training director. These proficiency assessment methods must reflect the additional responsibilities borne by supervisory personnel in hazardous waste operations or emergency response.

(8) Course certificate. Written documentation should be provided to each student who satisfactorily completes the training course. The documentation should include:

- (a) Student's name.
- (b) Course title.
- (c) Course date.
- (d) Statement that the student has successfully completed the course.
- (e) Name and address of the training provider.
- (f) An individual identification number for the certificate.
- (g) List of the levels of personal protective equipment used by the student to complete the course.
- (i) This documentation may include a certificate and an appropriate wallet-sized laminated card with a photograph of the student and the above information.

(ii) When such course certificate cards are used, the individual identification number for the training certificate should be shown on the card.

(9) Recordkeeping. Training providers should maintain records listing the dates courses were presented, the names of the individual course attendees, the names of those students successfully completing each course, and the number of training certificates issued to each successful student. These records should be maintained for a minimum of five years after the date an individual participated in a training program offered by the training provider. These records should be available and provided upon the student's request or as mandated by law.

(10) Program quality control. The training director should conduct or direct an annual written audit of the training program. Program modifications to address deficiencies, if any, should be documented, approved, and implemented by the training provider. The audit and the program modification documents should be maintained at the training facility.

Suggested Program Quality Control Criteria:

Factors listed here are suggested criteria for determining the quality and appropriateness of employee health and safety training for hazardous waste operations and emergency response.

(1) Training plan. Adequacy and appropriateness of the training program's curriculum development, instructor training, distribution of course materials, and direct student training should be considered, including:

- (a) The duration of training, course content, and course schedules/agendas;
- (b) The different training requirements of the various target populations, as specified in the appropriate generic training curriculum;

(c) The process for the development of curriculum, which includes appropriate technical input, outside review, evaluation, program pretesting.

(d) The adequate and appropriate inclusion of hands-on, demonstration, and instruction methods;

(e) Adequate monitoring of student safety, progress, and performance during the training.

(2) Program management, training director, staff, and consultants. Adequacy and appropriateness of staff performance and delivering an effective training program should be considered, including:

- (a) Demonstration of the training director's leadership in assuring quality of health and safety training;
- (b) Demonstration of the competency of the staff to meet the demands of delivering high quality hazardous waste employee health and safety training;
- (c) Organization charts establishing clear lines of authority;
- (d) Clearly defined staff duties including the relationship of the training staff to the overall program;
- (e) Evidence that the training organizational structure suits the needs of the training program;
- (f) Appropriateness and adequacy of the training methods used by the instructors;
- (g) Sufficiency of the time committed by the training director and staff to the training program;
- (h) Adequacy of the ratio of training staff to students;
- (i) Availability and commitment of the training program of adequate human and equipment resources in the areas of:
 - (i) Health effects;
 - (ii) Safety;
 - (iii) Personal protective equipment (PPE);
 - (iv) Operational procedures;
 - (v) Employee protection practices/procedures;
 - (j) Appropriateness of management controls;
 - (k) Adequacy of the organization and appropriate resources assigned to assure appropriate training;
 - (l) In the case of multiple-site training programs, adequacy of management of the satellite centers.
- (3) Training facilities and resources. Adequacy and appropriateness of the facilities and resources for supporting the training program should be considered, including:
 - (a) Space and equipment to conduct the training;
 - (b) Facilities for representative hands-on training;
 - (c) In the case of multiple-site programs, equipment and facilities at the satellite centers;
 - (d) Adequacy and appropriateness of the quality control and evaluations program to account for instructor performance;
 - (e) Adequacy and appropriateness of the quality control and evaluation program to ensure appropriate course evaluation, feedback, updating, and corrective action;
 - (f) Adequacy and appropriateness of disciplines and expertise being used within the quality control and evaluation program;
 - (g) Adequacy and appropriateness of the role of student evaluations to provide feedback for training program improvement.

(4) Quality control and evaluation. Adequacy and appropriateness of quality control and evaluation plans for training programs should be considered, including:

(a) A balanced advisory committee and/or competent outside reviewers to give overall policy guidance;

(b) Clear and adequate definition of the composition and active programmatic role of the advisory committee or outside reviewers;

(c) Adequacy of the minutes or reports of the advisory committee or outside reviewers' meetings or written communication;

(d) Adequacy and appropriateness of the quality control and evaluations program to account for instructor performance;

(e) Adequacy and appropriateness of the quality control and evaluation program to ensure appropriate course evaluation, feedback, updating, and corrective action;

(f) Adequacy and appropriateness of disciplines and expertise being used within the quality control and evaluation program;

(g) Adequacy and appropriateness of the role of student evaluations to provide feedback for training program improvement.

(5) Students. Adequacy and appropriateness of the program for accepting students should be considered, including:

(a) Assurance that the student already possess the necessary skills for their job, including necessary documentation;

(b) Appropriateness of methods the program uses to ensure that recruits are capable of satisfactorily completing training;

(c) Review and compliance with any medical clearance policy.

(6) Institutional environment and administrative support. The adequacy and appropriateness of the institutional environment and administrative support system for the training program should be considered, including:

(a) Adequacy of the institutional commitment to the employee training program;

(b) Adequacy and appropriateness of the administrative structure and administrative support.

(7) Summary of evaluation questions. Key questions for evaluating the quality and appropriateness of an overall training program should include the following:

(a) Are the program objectives clearly stated?

(b) Is the program accomplishing its objectives?

(c) Are appropriate facilities and staff available?

(d) Is there an appropriate mix of classroom, demonstration, and hands-on training?

(e) Is the program providing quality employee health and safety training that fully meets the intent of regulatory requirements?

(f) What are the program's main strengths?

(g) What are the program's main weaknesses?

(h) What is recommended to improve the program?

(i) Are instructors instructing according to their training outlines?

(j) Is the evaluation tool current and appropriate for the program content?

(k) Is the course material current and relevant to the target group?

Suggested Training Curriculum Guidelines:

The following training curriculum guidelines are for those operations specifically identified in this Part P, as requiring training. Issues such as qualifications of instructors, training certification, and similar criteria appropriate to all categories of operations addressed in this Part P, have been covered in the preceding section and are not readdressed in each of the generic guidelines. Basic core requirements for training programs that are addressed include: (1) *General hazardous waste operations*; (2) *RCRA operations—Treatment, storage, and disposal facilities*; and (3) *Emergency response*.

(1) General hazardous waste operations and site-specific training.

(a) Off-site training. Training course content for hazardous waste operations, required by WAC 296-62-3040, should include the following topics or procedures:

(i) Regulatory knowledge.

(A) A review of this Part P and the core elements of an occupational safety and health program.

(B) The content of a medical surveillance program as outlined in WAC 296-62-3050.

(C) The content of an effective site safety and health plan consistent with the requirements of WAC 296-62-3010 (4)(b).

(D) Emergency response plan and procedures as outlined in WAC 296-24-567 and 296-62-3110.

(E) Adequate illumination.

(F) Sanitation recommendation and equipment.

(G) Review and explanation of WISHA's hazard-communication standard chapter 296-62 WAC, Part C, and chapter 296-24 WAC, Part A-4, safety procedures for the control of hazardous energy (lockout/tagout).

(H) Review of other applicable standards including but not limited to those in the construction standards, chapter 296-155 WAC.

(I) Rights and responsibilities of employers and employees under applicable WISHA/OSHA and department of ecology (DOE)/Environmental Protection Association (EPA) regulations and laws.

(ii) Technical knowledge.

(A) Type of potential exposures to chemical, biological, and radiological hazards; types of human responses to these hazards and recognition of those responses; principles of toxicology and information about acute and chronic hazards; health and safety considerations of new technology.

(B) Fundamentals of chemical hazards including but not limited to vapor pressure, boiling points, flash points, pH, other physical and chemical properties.

(C) Fire and explosion hazards of chemicals.

(D) General safety hazards such as but not limited to electrical hazards, powered equipment hazards, motor vehicle hazards, walking-working surface hazards, excavation hazards, and hazards associated with working in hot and cold temperature extremes.

(E) Review and knowledge of confined space entry procedures in chapter 296-62 WAC, Part M.

(F) Work practices to minimize employee risk from site hazards.

(G) Safe use of engineering controls, equipment, and any new relevant safety technology or safety procedures.

(H) Review and demonstration of competency with air sampling and monitoring equipment that may be used in a site monitoring program.

(I) Container sampling procedures and safeguarding; general drum and container handling procedures including special requirement for laboratory waste packs, shock-sensitive wastes, and radioactive wastes.

(J) The elements of a spill control program.

(K) Proper use and limitations of material handling equipment.

(L) Procedures for safe and healthful preparation of containers for shipping and transport.

(M) Methods of communication including those used while wearing respiratory protection.

(iii) Technical skills.

(A) Selection, use maintenance, and limitations of personal protective equipment including the components and procedures for carrying out a respirator program to comply with chapter 296-62 WAC Part E, Respiratory Protection.

(B) Instruction in decontamination programs including personnel, equipment, and hardware; hands-on training including Levels A, B, and C ensembles and appropriate decontamination lines; field activities including the donning and doffing of protective equipment to a level commensurate with the employee's anticipated job function and responsibility and to the degree required by potential hazards.

(C) Sources for additional hazard information; exercises using relevant manuals and hazard coding systems.

(iv) Additional suggested items.

(A) A laminated, dated card or certificate with photo, denoting limitations and level of protection for which the employee is trained should be issued to those students successfully completing a course.

(B) Attendance should be required at all training modules, with successful completion of exercises and a final written or oral examination with at least fifty questions.

(C) A minimum of one-third of the program should be devoted to hands-on exercises.

(D) A curriculum should be established for the eight-hour refresher training required by WAC 296-62-4040(10), with delivery of such courses directed toward those areas of previous training that need improvement or reemphasis.

(E) A curriculum should be established for the required eight-hour training for supervisors. Demonstrated competency in the skills and knowledge provided in forty-hour and eighty-hour courses should be prerequisites for supervisor training.

(b) Refresher training. The eight-hour annual refresher training required in WAC 296-62-3040(10) should be conducted by qualified training providers. Refresher training should include at a minimum the following topics and procedures:

(i) Review of and retraining on relevant topics covered in the forty-hour and eighty-hour programs, as appropriate, using reports by the students on their work experiences.

(ii) Update on developments with respect to material covered in the forty-hour and eighty-hour courses.

(iii) Review of changes to pertinent provisions of DOE/EPA or WISHA/OSHA standards or laws.

(iv) Introduction of additional subject areas as appropriate.

(v) Hands-on review of new or altered PPE or decontamination equipment or procedures. Review of new developments in personal protective equipment.

(vi) Review of newly developed air and contaminant monitoring equipment.

(c) On-site training. The employer should provide employees engaged in hazardous waste site activities with information and training prior to initial assignment into their work area, as follows:

(i) The requirements of the hazard communication program including the location and availability of the written program, required lists of hazardous chemicals, and material safety data sheets.

(ii) Activities and locations in their work area where hazardous substance may be present.

(iii) Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearances, or other evidence (sight, sound or smell)) of hazardous chemicals being released, and applicable alarms from monitoring devices that record chemical releases.

(iv) The physical and health hazards of substances known or potentially present in the work area.

(v) The measures employees can take to help protect themselves from worksite hazards, including specific procedures the employer has implemented.

(vi) An explanation of the labeling system and material safety data sheets and how employees can obtain and use appropriate hazard information.

(vii) The elements of the confined space program including special PPE, permits, monitoring requirements, communication procedures, emergency response, and applicable lockout procedures.

(d) The employer should provide hazardous waste employees with information and training and should provide a review and access to the site safety and health plan as follows:

(i) Names of personnel and alternate responsible for site safety and health.

(ii) Safety and health hazards present on the site.

(iii) Selection, use, maintenance, and limitations of personal protective equipment specific to the site.

(iv) Work practices by which the employee can minimize risks from hazards.

(v) Safe use of engineering controls and equipment available on site.

(vi) Safe decontamination procedures established to minimize employee contact with hazardous substances, including:

(A) Employee decontamination;

(B) Clothing decontamination; and

(C) Equipment decontamination.

(vii) Elements of the site emergency response plan, including:

(A) Preemergency planning.

(B) Personnel roles and lines of authority and communication.

(C) Emergency recognition and prevention.

(D) Safe distances and places of refuge.

(E) Site security and control.

(F) Evacuation routes and procedures.

(G) Decontamination procedures not covered by the site safety and health plan.

(H) Emergency medical treatment and first aid.

(I) Emergency equipment and procedures for handling emergency incidents.

(e) The employer should provide hazardous waste employees with information and training on personal protective equipment used at the site, such as the following:

(i) PPE to be used based upon known or anticipated site hazards.

(ii) PPE limitations of materials and construction; limitations during temperature extremes, heat stress, and other appropriate medical considerations; use and limitations of respirator equipment as well as documentation procedures as outlined in chapter 296-62 WAC, Part E, Respiratory Protection.

(iii) PPE inspection procedures prior to, during, and after use.

(iv) PPE donning and doffing procedures.

(v) PPE decontamination and disposal procedures.

(vi) PPE maintenance and storage.

(vii) Task duration as related to PPE limitations.

(f) The employer should instruct the employee about the site medical surveillance program relative to the particular site, including:

(i) Specific medical surveillance programs that have been adapted for the site.

(ii) Specific signs and symptoms related to exposure to hazardous materials on the site.

(iii) The frequency and extent of periodic medical examinations that will be used on the site.

(iv) Maintenance and availability of records.

(v) Personnel to be contacted and procedures to be followed when signs and symptoms of exposures are recognized.

(g) The employees will review and discuss the site safety and health plan as part of the training program. The location of the site safety and health plan and all written programs should be discussed with employees including a discussion of the mechanisms for access, review, and references described.

(2) RCRA operations training for treatment, storage and disposal facilities.

(a) As a minimum, the training course required in WAC 296-62-3140 should include the following topics:

(i) Review of the applicable parts of this Part P and the elements of the employer's occupational safety and health plan.

(ii) Review of relevant hazards such as, but not limited to, chemical, biological, and radiological exposures; fire and explosion hazards; thermal extremes; and physical hazards.

(iii) General safety hazards including those associated with electrical hazards, powered equipment hazards, lockout/tagout procedures, motor vehicle hazards and walking-working surface hazards.

(iv) Confined space hazards and procedures.

(v) Work practices to minimize employee risk from workplace hazards.

(vi) Emergency response plan and procedures including first aid meeting the requirements of WAC 296-62-3140(8).

(vii) A review of procedures to minimize exposure to hazardous waste and various type of waste streams, including the materials handling program and spill containment program.

(viii) A review of hazard communication programs meeting the requirements of chapter 296-62 WAC, Part C.

(ix) A review of medical surveillance programs meeting the requirements of WAC 296-62-3050 and 296-62-3140(3) including the recognition of signs and symptoms of overexposure to hazardous substance including known synergistic interactions.

(x) A review of decontamination programs and procedures meeting the requirements of WAC 296-62-3100 and 296-62-3140(4).

(xi) A review of an employer's requirements to implement a training program and its elements.

(xii) A review of the criteria and programs for proper selection and use of personal protective equipment, including respirators.

(xiii) A review of the applicable appendices to this Part P (Appendices A through E).

(xiv) Principles of toxicology and biological monitoring as they pertain to occupational health.

(xv) Rights and responsibilities of employees and employers under applicable WISHA/OSHA and DOE/EPA regulations and laws.

(xvi) Hands-on exercises and demonstrations of competency with equipment to illustrate the basic equipment principles that may be used during the performance of work duties, including the donning and doffing of PPE.

(xvii) Sources of reference, efficient use of relevant manuals, and knowledge of hazard coding systems to include information contained in hazardous waste manifests.

(xviii) At least eight hours of hands-on training.

(xix) Training in the job skills required for an employee's job function and responsibility before they are permitted to participate in or supervise field activities.

(b) The individual employer should provide hazardous waste employees with information and training prior to an employee's initial assignment into a work area. The training and information should cover the following topics:

(i) The emergency response plan and procedures including first aid.

(ii) A review of the employer's hazardous waste handling procedures including the materials handling program and elements of the spill containment program, location of spill response kits or equipment, and the names of those trained to respond to releases.

(iii) The hazardous communication program meeting the requirements of chapter 296-62 WAC, Part C.

(iv) A review of the employer's medical surveillance program including the recognition of signs and symptoms of exposure to relevant hazardous substance including known synergistic interactions.

(v) A review of the employer's decontamination program and procedures.

(vi) A review of the employer's training program and the parties responsible for that program.

(vii) A review of the employer's personal protective equipment program including the proper selection and use of PPE based upon specific site hazards.

(viii) All relevant site-specific procedures addressing potential safety and health hazards. This may include, as appropriate, biological and radiological exposures, fire and explosion hazards, thermal hazards, and physical hazards such as electrical hazards, powered equipment hazards, lockout/tagout hazards, motor vehicle hazards, and walking-working surface hazards.

(ix) Safe use of engineering controls and equipment on-site.

(x) Names of personnel and alternates responsible for safety and health.

(3) Emergency response training.

(a) General considerations. Emergency response organizations are required to consider the topics listed in WAC 296-62-3112(6). Emergency response organizations may use some or all of the following topics to supplement those mandatory topics when developing their response training programs. Many of the topics would require an interaction between the response provider and the individuals responsible for the site where the response would be expected.

(i) Hazard recognition, including:

(A) Nature of hazardous substances present;

(B) Practical applications of hazard recognition, including presentations on biology, chemistry, and physics.

(ii) Principles of toxicology, biological monitoring, and risk assessment.

(iii) Safe work practices and general site safety.

(iv) Engineering controls and hazardous waste operations.

(v) Site safety plans and standard operating procedures.

(vi) Decontamination procedures and practices.

(vii) Emergency procedures, first aid, and self-rescue.

(viii) Safe use of field equipment.

(ix) Storage, handling, use and transportation of hazardous substances.

(x) Use, care, and limitations of personal protective equipment.

(xi) Safe sampling techniques.

(xii) Rights and responsibilities of employees under WISHA and other related regulations and laws concerning right-to-know, safety and health, compensations and liability.

(xiii) Medical monitoring requirements.

(xiv) Community relations.

(b) Suggested criteria for specific courses.

(i) First responder awareness level.

(A) Review of and demonstration of competency in performing the applicable skills of WAC 296-62-3112.

(B) Hands-on experience with the U.S. Department of Transportation's *Emergency Response Guidebook* (ERG) and familiarization with chapter 296-62 WAC, Part C, the hazard communication standard.

(C) Review of the principles and practices for analyzing an incident to determine both the hazardous substances

present and the basic hazard and response information for each hazardous substance present.

(D) Review of procedures for implementing actions consistent with the local emergency response plan, the organization's standard operating procedures, and the current edition of DOT's ERG including emergency notification procedures and follow-up communications.

(E) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.

(F) Awareness and knowledge of the competencies for the First Responder at the Awareness Level covered in the National Fire Protection Association's Standard No. 472, Professional Competence of Responders to Hazardous Materials Incidents.

(ii) First responder operations level.

(A) Review of and demonstration of competency in performing the applicable skills of WAC 296-62-3112.

(B) Hands-on experience with the U.S. Department of Transportation's *Emergency Response Guidebook* (ERG), manufacturer material safety data sheets, CHEMTREC/CANUTEC, shipper or manufacturer contacts, and other relevant sources of information addressing hazardous substance releases. Familiarization with chapter 296-62 WAC, Part C, the hazard communication standard.

(C) Review of the principles and practices for analyzing an incident to determine the hazardous substances present, the likely behavior of the hazardous substance and its container, the types of hazardous substance transportation containers and vehicles, the types and selection of the appropriate defensive strategy for containing the release.

(D) Review of procedures for implementing continuing response actions consistent with the local emergency response plan, the organization's standard operating procedures, and the current edition of DOT's ERG including extended emergency notification procedures and follow-up communications.

(E) Review of the principles and practice for proper selection and use of personal protective equipment.

(F) Review of the principles and practice of personnel and equipment decontamination.

(G) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.

(H) Awareness and knowledge of the competencies for the First Responder at the Operations Level covered in the National Fire Protection Association's Standard No. 472, Professional Competence of Responders to Hazardous Materials Incidents.

(iii) Hazardous materials technician.

(A) Review of and demonstration of competency in performing the applicable skills of WAC 296-62-3112.

(B) Hands-on experience with written and electronic information relative to response decision making including but not limited to the U.S. Department of Transportation's *Emergency Response Guidebook* (ERG), manufacturer material safety data sheets, CHEMTREC/CANUTEC, shipper or manufacturer contacts, computer data bases and response

models, and other relevant sources of information addressing hazardous substance releases. Familiarization with chapter 296-62 WAC, Part C, the hazard communication standard.

(C) Review of the principles and practices for analyzing an incident to determine the hazardous substances present, their physical and chemical properties, the likely behavior of the hazardous substance and its container, the types of hazardous substance transportation containers and vehicles involved in the release, the appropriate strategy for approaching release sites and containing the release.

(D) Review of procedures for implementing continuing response actions consistent with the local emergency response plan, the organization's standard operating procedures, and the current edition of DOT's ERG including extended emergency notification procedures and follow-up communications.

(E) Review of the principles and practice for proper selection and use of personal protective equipment.

(F) Review of the principles and practices of establishing exposure zones, proper decontamination and medical surveillance stations and procedures.

(G) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.

(H) Awareness and knowledge of the competencies for the Hazardous Materials Technician covered in the National Fire Protection Association's Standard No. 472, Professional Competence of Responders to Hazardous Materials Incidents.

(iv) Hazardous materials specialist.

(A) Review of and demonstration of competency in performing the applicable skills of WAC 296-62-3112.

(B) Hands-on experience with retrieval and use of written and electronic information relative to response decision making including but not limited to the U.S. Department of Transportation's *Emergency Response Guidebook* (ERG), manufacturer material safety data sheets, CHEMTREC/CANUTEC, shipper or manufacturer contacts, computer data bases and response models, and other relevant sources of information addressing hazardous substance releases. Familiarization with chapter 296-62 WAC, Part C, the hazard communication standard.

(C) Review of the principles and practices for analyzing an incident to determine the hazardous substances present, their physical and chemical properties, and the likely behavior of the hazardous substance and its container, vessel, or vehicle.

(D) Review of the principles and practices for identification of the types of hazardous substance transportation containers, vessels and vehicles involved in the release; selecting and using the various types of equipment available for plugging or patching transportation containers, vessels or vehicles; organizing and directing the use of multiple teams of hazardous material technicians and selecting the appropriate strategy for approaching release sites and containing or stopping the release.

(E) Review of procedures for implementing continuing response actions consistent with the local emergency response plan, the organization's standard operating proce-

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dures, including knowledge of the available public and private response resources, establishment of an incident command post, direction of hazardous material technician teams, and extended emergency notification procedures and follow-up communications.

(F) Review of the principles and practice for proper selection and use of personal protective equipment.

(G) Review of the principles and practices of establishing exposure zones and proper decontamination, monitoring and medical surveillance stations and procedures.

(H) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.

(I) Awareness and knowledge of the competencies for the Off-site Specialist Employee covered in the National Fire Protection Association's Standard No. 472, Professional Competence of Responders to Hazardous Materials Incidents.

(v) Incident commander.

The incident commander is the individual who, at any one time, is responsible for and in control of the response effort. This individual is the person responsible for the direction and coordination of the response effort. An incident commander's position should be occupied by the most senior, appropriately trained individual present at the response site. Yet, as necessary and appropriate by the level of response provided, the position may be occupied by many individuals during a particular response as the need for greater authority, responsibility, or training increases. It is possible for the first responder at the awareness level to assume the duties of incident commander until a more senior and appropriately trained individual arrives at the response site.

Therefore, any emergency responder expected to perform as an incident commander should be trained to fulfill the obligations of the position at the level of response they will be providing including the following:

(A) Ability to analyze a hazardous substance incident to determine the magnitude of the response problem.

(B) Ability to plan and implement an appropriate response plan within the capabilities of available personnel and equipment.

(C) Ability to implement a response to favorably change the outcome of the incident in a manner consistent with the local emergency response plan and the organization's standard operating procedures.

(D) Ability to evaluate the progress of the emergency response to ensure that the response objectives are being met safely, effectively, and efficiently.

(E) Ability to adjust the response plan to the conditions of the response and to notify higher levels of response when required by the changes to the response plan.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-62-3195, filed 1/18/95, effective 3/10/95.]

PART Q—HAZARDOUS CHEMICALS IN LABORATORIES

WAC 296-62-400 Occupational exposure to hazardous chemicals in laboratories. Reserved.

[Title 296 WAC—p. 1771]

[Statutory Authority: Chapter 49.17 RCW. 90-17-051 (Order 90-10), § 296-62-400, filed 8/13/90, effective 9/24/90.]

WAC 296-62-40001 Scope and application. (1) This section shall apply to all employers and employees engaged in the laboratory use of hazardous chemicals as follows:

(a) Where this section applies, it shall supersede, for laboratories, the requirements of all other WISHA health standards in chapter 296-62 WAC, except for any WISHA health standard, only the requirement to limit employee exposure to the specific permissible exposure limit shall apply for laboratories, unless that particular standard states otherwise or unless the conditions of subdivision (c) of this section apply.

(b) Prohibition of eye and skin contact where specified by any WISHA health standard shall be observed.

(c) Where the action level (or in the absence of an action level, the permissible exposure limit) is routinely exceeded for a WISHA regulated substance with exposure monitoring and medical surveillance requirements, of WAC 296-62-40007.

(2) This section shall not apply to:

(a) Uses of hazardous chemicals which do not meet the definition of laboratory use, and in such cases, the employer shall comply with the relevant standard in WAC 296-62-075, even if such use occurs in a laboratory.

(b) Laboratory uses of hazardous chemicals which provide no potential for employee exposure. Examples of such conditions might include:

(i) Procedures using chemically-impregnated test media such as Dip-and-Read tests where a reagent strip is dipped into the specimen to be tested and the results are interpreted by comparing the color reaction to a color chart supplied by the manufacturer of the test strip; and

(ii) Commercially prepared kits such as those used in performing pregnancy tests in which all of the reagents needed to conduct the test are contained in the kit.

[Statutory Authority: Chapter 49.17 RCW. 90-17-051 (Order 90-10), § 296-62-40001, filed 8/13/90, effective 9/24/90.]

WAC 296-62-40003 Definitions applicable to all sections of this chapter. Unless the context indicates otherwise, words used in this chapter shall have the meaning given in this section.

(1) "Action level" means a concentration designated in WAC 296-62-075 for a specific substance, calculated as an 8-hour time-weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance.

(2) "Carcinogen" (see "select carcinogen").

(3) "Chemical hygiene officer" means an employee who is designated by the employer, and who is qualified by training or experience, to provide technical guidance in the development and implementation of the provisions of the chemical hygiene plan. This definition is not intended to place limitations on the position description or job classification that the designated individual shall hold within the employer's organizational structure.

(4) "Chemical hygiene plan" means a written program developed and implemented by the employer which sets forth procedures, equipment, personal protective equipment, and work practices that are capable of protecting employees from

the health hazards presented by hazardous chemicals used in that particular workplace and meets the requirements of WAC 296-62-40009.

(5) "Combustible liquid" means any liquid having a flashpoint at or above 100°F (37.8°C), but below 200°F (93.3°C), except any mixture having components with flashpoints of 200°F (93.3°C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

(6) "Compressed gas" means:

(a) A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70°F (21.1°C); or

(b) A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130°F (54.4°C) regardless of the pressure at 70 °F (21.1°C); or

(c) A liquid having a vapor pressure exceeding 40 psi at 100°F (37.8°C) as determined by ASTM D-323-72.

(7) "Designated area" means an area which may be used for work with "select carcinogens," reproductive toxins or substances which have a high degree of acute toxicity. A designated area may be the entire laboratory, an area of a laboratory or a device such as a laboratory hood.

(8) "Director" means the director of the department of labor and industries or his/her designee.

(9) "Emergency" means any occurrence such as, but not limited to, equipment failure, rupture of containers or failure of control equipment which results in an uncontrolled release of a hazardous chemical into the workplace.

(10) "Employee" means an individual employed in a laboratory workplace who may be exposed to hazardous chemicals in the course of his or her assignments.

(11) "Explosive" means a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

(12) "Flammable" means a chemical that falls into one of the following categories:

(a) "Aerosol, flammable" means an aerosol that, when tested by the method described in 16 C.F.R. 1500.45, yields a flame protection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;

(b) "Gas, flammable" means:

(i) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of 13 percent by volume or less; or

(ii) A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than 12 percent by volume, regardless of the lower limit.

(c) "Liquid, flammable" means any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up 99 percent or more of the total volume of the mixture.

(d) "Solid, flammable" means a solid, other than a blasting agent or explosive as defined in WAC 296-52-417, that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create

a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 C.F.R. 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

(13) "Flashpoint" means the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

(a) Tagliabue Closed Tester (see American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24-1979 (ASTM D 56-79))-for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100 deg.F (37.8 °C), that do not contain suspended solids and do not have a tendency to form a surface film under test; or

(b) Pensky-Martens Closed Tester (see American National Standard Method of Test for Flash Point by Pensky-Martens Closed Tester, Z11.7-1979 (ASTM D 93-79))-for liquids with a viscosity equal to or greater than 45 SUS at 100 deg.F (37.8 °C), or that contain suspended solids, or that have a tendency to form a surface film under test; or

(c) Setaflash Closed Tester (see American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTM D 3278-78)).

Note: Organic peroxides, which undergo autoaccelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above.

(14) "Hazardous chemical" means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic systems, and agents which damage the lungs, skin, eyes, or mucous membranes.

Note: Appendices A and B of the Hazard Communication Standard (WAC 296-62-054) provide further guidance in defining the scope of health hazards and determining whether or not a chemical is to be considered hazardous for purposes of this standard.

(15) "Laboratory" means a facility where the "laboratory use of hazardous chemicals" occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a nonproduction basis.

(16) "Laboratory scale" means work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person. "Laboratory scale" excludes those workplaces whose function is to produce commercial quantities of materials.

(17) "Laboratory-type hood" means a device located in a laboratory, enclosure on five sides with a moveable sash or fixed partial enclosed on the remaining side; constructed and maintained to draw air from the laboratory and to prevent or minimize the escape of air contaminants into the laboratory; and allows chemical manipulations to be conducted in the enclosure without insertion of any portion of the employee's body other than hands and arms.

Note: Walk-in hoods with adjustable sashes meet the above definition provided that the sashes are adjusted during use so that the airflow and the exhaust of air contaminants are not compromised and employees do not work inside the enclosure during the release of airborne hazardous chemicals.

(18) "Laboratory use of hazardous chemicals" means handling or use of such chemicals in which all of the following conditions are met:

(a) Chemical manipulations are carried out on a "laboratory scale";

(b) Multiple chemical procedures or chemicals are used;

(c) The procedures involved are not part of a production process, nor in any way simulate a production process; and

(d) "Protective laboratory practices and equipment" are available and in common use to minimize the potential for employee exposure to hazardous chemicals.

(19) "Medical consultation" means a consultation which takes place between an employee and a licensed physician for the purpose of determining what medical examinations or procedures, if any, are appropriate in cases where a significant exposure to a hazardous chemical may have taken place.

(20) "Organic peroxide" means an organic compound that contains the bivalent -O-O-structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

(21) "Oxidizer" means a chemical other than a blasting agent or explosive as defined in WAC 296-52-417, that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

(22) "Physical hazard" means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.

(23) "Protective laboratory practices and equipment" means those laboratory procedures, practices, and equipment accepted by laboratory health and safety experts as effective, or that the employer can show to be effective, in minimizing the potential for employee exposure to hazardous chemicals.

(24) "Reproductive toxins" means chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis).

(25) "Select carcinogen" means any substance which meets one of the following criteria:

(a) It is regulated by WISHA as a carcinogen; or

(b) It is listed under the category, "known to be carcinogens," in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (latest edition); or

(c) It is listed under Group I ("carcinogenic to humans") by the International Agency for Research on Cancer Monographs (IARC) (latest editions); or

(d) It is listed in either Group 2A or 2B by IARC or under the category, "reasonably anticipated to be carcinogens" by NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria:

(i) After inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m³; or

(ii) After repeated skin application of less than 300 (mg/kg of body weight) per week; or

(iii) After oral dosages of less than 50 mg/kg of body weight per day.

(26) "Unstable (reactive)" means a chemical which is the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shock, pressure, or temperature.

(27) "Water-reactive" means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

[Statutory Authority: Chapter 49.17 RCW. 90-17-051 (Order 90-10), § 296-62-40003, filed 8/13/90, effective 9/24/90.]

WAC 296-62-40005 Permissible exposure limits. For laboratory uses of WISHA regulated substances, the employer shall assure that laboratory employees' exposures to such substances do not exceed the permissible exposure limits specified in WAC 296-62-075.

[Statutory Authority: Chapter 49.17 RCW. 90-17-051 (Order 90-10), § 296-62-40005, filed 8/13/90, effective 9/24/90.]

WAC 296-62-40007 Employee exposure determination. (1) Initial monitoring. The employer shall measure the employee's exposure to any substance regulated by a standard which requires monitoring if there is reason to believe that exposure levels for that substance routinely exceed the action level (or in the absence of an action level, the PEL).

(2) Periodic monitoring. If the initial monitoring prescribed by subsection (1) of this section discloses employee exposure over the action level (or in the absence of an action level, the PEL), the employer shall immediately comply with the exposure monitoring provisions of chapter 296-62 WAC.

(3) Termination of monitoring. Monitoring may be terminated in accordance with chapter 296-62 WAC.

(4) Employee notification of monitoring results. The employer shall, within 15 working days after the receipt of any monitoring results, notify the employee of these results in writing either individually or by posting results in an appropriate location that is accessible to employees.

[Statutory Authority: Chapter 49.17 RCW. 90-17-051 (Order 90-10), § 296-62-40007, filed 8/13/90, effective 9/24/90.]

WAC 296-62-40009 Chemical hygiene plan—General. (1) Where hazardous chemicals as defined by this standard are used in the workplace, the employer shall develop and carry out the provisions of a written chemical hygiene plan which is:

(a) Capable of protecting employees from health hazards associated with hazardous chemicals in that laboratory; and

(b) Capable of keeping exposures below the limits specified in WAC 296-62-40005.

(2) The chemical hygiene plan shall be readily available to employees, employee representatives and, upon request, to the director of the department of labor and industries.

(3) The chemical hygiene plan shall include each of the following elements and shall indicate specific measures that the employer will take to ensure laboratory employee protection:

(a) Standard operating procedures for safety and health considerations to be followed when laboratory work involves the use of hazardous chemicals;

(b) Criteria that the employer will use to determine and implement control measures to reduce employee exposure to hazardous chemicals including engineering controls, the use of personal protective equipment, and hygiene practices. Particular attention shall be given to the selection of control measures for chemicals that are known to be extremely hazardous;

(c) A requirement that fume hoods and other protective equipment are functioning properly and specific measures that shall be taken to ensure proper and adequate performance of such equipment;

(d) Provisions for employee information and training as prescribed in WAC 296-62-40011;

(e) The circumstances under which a particular laboratory operation, procedure, or activity shall require prior approval from the employer or the employer's designee before implementation;

(f) Provisions for medical consultation and medical examinations in accordance with WAC 296-62-40013;

(g) Designation of personnel responsible for implementation of the chemical hygiene plan including the assignment of a chemical hygiene officer and, if appropriate, establishment of a chemical hygiene committee; and

(h) Provisions for additional employee protection for work with particularly hazardous substances. These include "select carcinogens," reproductive toxins and substances which have a high degree of acute toxicity. Specific consideration shall be given to the following provisions which shall be included where appropriate:

(i) Establishment of a designated area;

(ii) Use of containment devices such as fume hoods or glove boxes;

(iii) Procedures for safe removal of contaminated waste; and

(iv) Decontamination procedures.

(4) The employer shall review and evaluate the effectiveness of the chemical hygiene plan at least annually and update it as necessary.

(5) Appendix A of this section is nonmandatory but provides guidance to assist employers in the development of the chemical hygiene plan.

[Statutory Authority: Chapter 49.17 RCW. 90-17-051 (Order 90-10), § 296-62-40009, filed 8/13/90, effective 9/24/90.]

WAC 296-62-40011 Employee information and training. (1) The employer shall provide employees with information and training to ensure that they are apprised of the hazards of chemicals present in their work area.

(2) Such information shall be provided at the time of an employee's initial assignment to a work area where hazardous chemicals are present and prior to assignments involving new exposure situations. The frequency of refresher information and training shall be determined by the employer.

(3) Information. Employees shall be informed of:

(a) The contents of this standard and its appendices which shall be made available to employees;

(b) The location and availability of the employer's chemical hygiene plan;

(c) The permissible exposure limits for WISHA regulated substances or recommended exposure limits for other hazardous chemicals where there is no applicable WISHA standard;

(d) Signs and symptoms associated with exposures to hazardous chemicals used in the laboratory; and

(e) The location and availability of known reference material on the hazards, safe handling, storage, and disposal of hazardous chemicals found in the laboratory including, but not limited to, material safety data sheets received from the chemical supplier.

(4) Training. Employee training shall include:

(a) Methods and observations that may be used to detect the presence or release of a hazardous chemical (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);

(b) The physical and health hazards of chemicals in the work area; and

(c) The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used.

(5) The employee shall be trained on the applicable details of the employer's written chemical hygiene plan.

[Statutory Authority: Chapter 49.17 RCW, 90-17-051 (Order 90-10), § 296-62-40011, filed 8/13/90, effective 9/24/90.]

WAC 296-62-40013 Medical consultation and medical examinations. (1) The employer shall provide all employees who work with hazardous chemicals an opportunity to receive medical attention, including any follow-up examinations which the examining physician determines to be necessary, under the following circumstances:

(a) Whenever an employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory, the employee shall be provided an opportunity to receive an appropriate medical examination.

(b) Where exposure monitoring reveals an exposure level routinely above the action level (or in the absence of an action level, the PEL) for a WISHA regulated substance for which there are exposure monitoring and medical surveillance requirements, medical surveillance shall be established for the affected employee as prescribed by the particular standard.

(c) Whenever an event takes place in the work area such as a spill, leak, explosion, or other occurrence resulting in the likelihood of a hazardous exposure, the affected employee shall be provided an opportunity for a medical consultation. Such consultation shall be for the purpose of determining the need for a medical examination.

(2) All medical examinations and consultations shall be performed by or under the direct supervision of a licensed physician and shall be provided without cost to the employee, without loss of pay and at a reasonable time and place.

(1999 Ed.)

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

(a) The identity of the hazardous chemical(s) to which the employee may have been exposed;

(b) A description of the conditions under which the exposure occurred including quantitative exposure data, if available; and

(c) A description of the signs and symptoms of exposure that the employee is experiencing, if any.

(4) Physician's written opinion.

(a) For examination or consultation required under this standard, the employer shall obtain a written opinion from the examining physician which shall include the following:

(i) Any recommendation for further medical follow-up;

(ii) The results of the medical examination and any associated tests;

(iii) Any medical condition which may be revealed in the course of the examination which may place the employee at increased risk as a result of exposure to a hazardous chemical found in the workplace; and

(iv) A statement that the employee has been informed by the physician of the results of the consultation or medical examination and any medical condition that may require further examination or treatment.

(b) The written opinion shall not reveal specific findings of diagnoses unrelated to occupational exposure.

[Statutory Authority: Chapter 49.17 RCW, 90-17-051 (Order 90-10), § 296-62-40013, filed 8/13/90, effective 9/24/90.]

WAC 296-62-40015 Hazard identification. (1) With respect to labels and material safety data sheets:

(a) Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced.

(b) Employers shall maintain any material safety data sheets that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible to laboratory employees.

(2) The following provisions shall apply to chemical substances developed in the laboratory:

(a) If the composition of the chemical substance which is produced exclusively for the laboratory's use is known, the employer shall determine if it is a hazardous chemical as defined in the definition section, Part Q of this standard. If the chemical is determined to be hazardous, the employer shall provide appropriate training as required under WAC 296-62-40011.

(b) If the chemical produced is a byproduct whose composition is not known, the employer shall assume that the substance is hazardous and shall implement WAC 296-62-40009.

(c) If the chemical substance is produced for another user outside of the laboratory, the employer shall comply with the hazard communication standard (WAC 296-62-054) including the requirements for preparation of material safety data sheets and labeling.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-62-40015, filed 7/20/94, effective 9/20/94; 90-17-051 (Order 90-10), § 296-62-40015, filed 8/13/90, effective 9/24/90.]

WAC 296-62-40017 Use of respirators. Where the use of respirators is necessary to maintain exposure below per-

missible exposure limits, the employer shall provide, at no cost to the employee, the proper respiratory equipment. Respirators shall be selected and used in accordance with the requirements of WAC 296-62-071.

[Statutory Authority: Chapter 49.17 RCW. 90-17-051 (Order 90-10), § 296-62-40017, filed 8/13/90, effective 9/24/90.]

WAC 296-62-40019 Recordkeeping. (1) The employer shall establish and maintain for each employee an accurate record of any measurements taken to monitor employee exposures and any medical consultation and examinations including tests or written opinions required by this standard.

(2) The employer shall assure that such records are kept, transferred, and made available in accordance with WAC 296-62-052.

[Statutory Authority: Chapter 49.17 RCW. 90-17-051 (Order 90-10), § 296-62-40019, filed 8/13/90, effective 9/24/90.]

WAC 296-62-40021 Start-up date. Employers shall have developed and implemented a written chemical hygiene plan no later than January 31, 1991.

[Statutory Authority: Chapter 49.17 RCW. 90-17-051 (Order 90-10), § 296-62-40021, filed 8/13/90, effective 9/24/90.]

WAC 296-62-40023 Appendices. The information contained in the appendices is not intended by itself to create any additional obligations not otherwise imposed or to detract from any existing obligation.

[Statutory Authority: Chapter 49.17 RCW. 90-17-051 (Order 90-10), § 296-62-40023, filed 8/13/90, effective 9/24/90.]

WAC 296-62-40025 Appendix A—National Research Council recommendations concerning chemical hygiene in laboratories (nonmandatory). (1) Table of contents.

- (a) General principles.
 - (i) Minimize all chemical exposures.
 - (ii) Avoid underestimation of risk.
 - (iii) Provide adequate ventilation.
 - (iv) Institute a chemical hygiene program.
 - (v) Observe the PELs and TLVs.
- (b) Responsibilities.
 - (i) Chief executive officer.
 - (ii) Supervisor of administrative unit.
 - (iii) Chemical hygiene officer.
 - (iv) Laboratory supervisor.
 - (v) Project director.
 - (vi) Laboratory worker.
- (c) The laboratory facility.
 - (i) Design.
 - (ii) Maintenance.
 - (iii) Usage.
 - (iv) Ventilation.
- (d) Components of the chemical hygiene plan.
 - (i) Basic rules and procedures.
 - (ii) Chemical procurement, distribution, and storage.
 - (iii) Environmental monitoring.
 - (iv) Housekeeping, maintenance, and inspections.
 - (v) Medical program.
 - (vi) Personal protective apparel and equipment.
 - (vii) Records.
 - (viii) Signs and labels.

- (ix) Spills and accidents.
- (x) Training and information.
- (xi) Waste disposal.
- (e) General procedures for working with chemicals.
 - (i) General rules for all laboratory work with chemicals.
 - (ii) Allergens and embryotoxins.
 - (iii) Chemicals of moderate chronic or high acute toxicity.
 - (iv) Chemicals of high chronic toxicity.
 - (v) Animal work with chemicals of high chronic toxicity.
 - (f) Safety recommendations.
 - (g) Material safety data sheets.
- (2) Foreword.

(a) As guidance for each employer's development of an appropriate laboratory chemical hygiene plan, the following nonmandatory recommendations are provided. They were extracted from "Prudent Practices for Handling Hazardous Chemicals in Laboratories" (referred to below as "Prudent Practices"), which was published in 1981 by the National Research Council and is available from the National Academy Press, 2101 Constitution Ave., N.W., Washington DC 20418.

(b) "Prudent practices" is cited because of its wide distribution and acceptance and because of its preparation by members of the laboratory community through the sponsorship of the National Research Council. However, none of the recommendations given here will modify any requirements of the laboratory standard. This appendix merely presents pertinent recommendations from "prudent practices," organized into a form convenient for quick reference during operation of a laboratory facility and during development and application of a chemical hygiene plan. Users of this appendix should consult "prudent practices" for a more extended presentation and justification for each recommendation.

(c) "Prudent practices" deals with both safety and chemical hazards while the laboratory standard is concerned primarily with chemical hazards. Therefore, only those recommendations directed primarily toward control of toxic exposures are cited in this appendix, with the term "chemical hygiene" being substituted for the word "safety." However, since conditions producing or threatening physical injury often pose toxic risks as well, page references concerning major categories of safety hazards in the laboratory are given in section F.

(d) The recommendations from "prudent practices" have been paraphrased, combined, or otherwise reorganized, and headings have been added. However, their sense has not been changed.

(e) Corresponding sections of the standard and this appendix.

(f) The following table is given for the convenience of those who are developing a chemical hygiene plan which will satisfy the requirements of WAC 296-62-40009. It indicates those sections of this appendix which are most pertinent to each of the sections of WAC 296-62-40009 and related sections.

Subsection and Topic in Laboratory Standard	Relevant Appendix Section
(3)(a) Standard operating procedures for handling toxic chemicals.	(c)(d)(e)
(3)(b) Criteria to be used for implementation of measures to reduce exposures.	(c)
(3)(c) Fume hood performance	(c)(iv)(B)
(3)(d) Employee information and training (including emergency procedures).	(d)(x), (d)(ix)
(3)(e) Requirements for prior approval of laboratory activities.	(e)(ii)(B), (e)(v)(B)
(3)(f) Medical consultation and medical examinations.	(d)(v), (e)(v)(G)
(3)(g) Chemical hygiene responsibilities.	(b)
(3)(h) Special precautions for work with particularly hazardous substances.	(e)(ii)(iii)(v)

(3) In this appendix, those recommendations directed primarily at administrators and supervisors are given in sections (a) through (d). Those recommendations of primary concern to employees who are actually handling laboratory chemicals are given in section E. (Reference to page numbers in "prudent practices" are given in parentheses.)

(a) General principles for work with laboratory chemicals in addition to the more detailed recommendations listed below in sections (b) through (e), "prudent practices" expresses certain general principles, including the following:

(i) It is prudent to minimize all chemical exposures. Because few laboratory chemicals are without hazards, general precautions for handling all laboratory chemicals should be adopted, rather than specific guidelines for particular chemicals (2, 10). Skin contact with chemicals should be avoided as a cardinal rule (198).

(ii) Avoid underestimation of risk. Even for substances of no known significant hazard, exposure should be minimized; for work with substances which present special hazards, special precautions should be taken (10, 37, 38). One should assume that any mixture will be more toxic than its most toxic component (30, 103) and that all substances of unknown toxicity are toxic (3, 34).

(iii) Provide adequate ventilation. The best way to prevent exposure to airborne substances is to prevent their escape into the working atmosphere by use of hoods and other ventilation devices (32, 198).

(iv) Institute a chemical hygiene program. A mandatory chemical hygiene program designed to minimize exposures is needed; it should be a regular, continuing effort, not merely a standby or short-term activity (6, 11). Its recommendations should be followed in academic teaching laboratories as well as by full-time laboratory workers (13).

(v) Observe the PELs, TLVs. The permissible exposure limits of WISHA and the threshold limit values of the American Conference of Governmental Industrial Hygienists should not be exceeded (13).

(b) Chemical hygiene responsibilities. Responsibility for chemical hygiene rests at all levels (6, 11, 21) including the:

(i) Chief executive officer, who has ultimate responsibility for chemical hygiene within the institution and must, with other administrators, provide continuing support for institutional chemical hygiene (7, 11).

(ii) Supervisor of the department or other administrative unit, who is responsible for chemical hygiene in that unit (7).

(iii) Chemical hygiene officer(s), whose appointment is essential (7) and who must:

(A) Work with administrators and other employees to develop and implement appropriate chemical hygiene policies and practices (7);

(B) Monitor procurement, use, and disposal of chemicals used in the lab (8);

(C) See that appropriate audits are maintained (8);

(D) Help project directors develop precautions and adequate facilities (10);

(E) Know the current legal requirements concerning regulated substances (50); and

(F) Seek ways to improve the chemical hygiene program (8, 11).

(iv) Laboratory supervisor, who has overall responsibility for chemical hygiene in the laboratory (21) including responsibility to:

(A) Ensure that workers know and follow the chemical hygiene rules, that protective equipment is available and in working order, and that appropriate training has been provided (21, 22);

(B) Provide regular, formal chemical hygiene and house-keeping inspections including routine inspections of emergency equipment (21, 171);

(C) Know the current legal requirements concerning regulated substances (50, 231);

(D) Determine the required levels of protective apparel and equipment (156, 160, 162); and

(E) Ensure that facilities and training for use of any material being ordered are adequate (215).

(v) Project director or director of other specific operation, who has primary responsibility for chemical hygiene procedures for that operation (7).

(vi) Laboratory worker, who is responsible for:

(A) Planning and conducting each operation in accordance with the institutional chemical hygiene procedures (7, 21, 22, 230); and

(B) Developing good personal chemical hygiene habits (22).

(c) The laboratory facility:

(i) Design. The laboratory facility should have:

(A) An appropriate general ventilation system (see C4 below) with air intakes and exhausts located so as to avoid intake of contaminated air (194);

(B) Adequate, well-ventilated stockrooms/storerooms (218, 219);

(C) Laboratory hoods and sinks (12, 162);

(D) Other safety equipment including eyewash fountains and drench showers (162, 169); and

(E) Arrangements for waste disposal (12, 240).

(ii) Maintenance. Chemical-hygiene-related equipment (hoods, incinerator, etc.) should undergo continuing appraisal and be modified if inadequate (11, 12).

(iii) Usage. The work conducted (10) and its scale (12) must be appropriate to the physical facilities available and, especially, to the quality of ventilation (13).

(iv) Ventilation.

(A) General laboratory ventilation. This system should: Provide a source of air for breathing and for input to local ventilation devices (199); it should not be relied on for protection from toxic substances released into the laboratory (198); ensure that laboratory air is continually replaced, preventing increase of air concentrations of toxic substances during the working day (194); direct air flow into the laboratory from nonlaboratory areas and out to the exterior of the building (194).

(B) Hoods. A laboratory hood with 2.5 linear feet of hood space per person should be provided for every 2 workers if they spend most of their time working with chemicals (199); each hood should have a continuous monitoring device to allow convenient confirmation of adequate hood performance before use (200, 209). If this is not possible, work with substances of unknown toxicity should be avoided (13) or other types of local ventilation devices should be provided (199). (See pp. 201-206 for a discussion of hood design, construction, and evaluation.)

(C) Other local ventilation devices. Ventilated storage cabinets, canopy hoods, snorkels, etc., should be provided as needed (199). Each canopy hood and snorkel should have a separate exhaust duct (207).

(D) Special ventilation areas. Exhaust air from glove boxes and isolation rooms should be passed through scrubbers or other treatment before release into the regular exhaust system (208). Cold rooms and warm rooms should have provisions for rapid escape and for escape in the event of electrical failure (209).

(E) Modifications. Any alteration of the ventilation system should be made only if thorough testing indicates that worker protection from airborne toxic substances will continue to be adequate (12, 193, 204).

(F) Performance. Rate: 4-12 room air changes/hour is normally adequate general ventilation if local exhaust systems such as hoods are used as the primary method of control (194).

(G) Quality. General air flow should not be turbulent and should be relatively uniform throughout the laboratory, with no high velocity or static areas (194, 195); airflow into and within the hood should not be excessively turbulent (200); hood face velocity should be adequate (typically 60-100 fpm) (200, 204).

(H) Evaluation. Quality and quantity of ventilation should be evaluated on installation (202), regularly monitored (at least every 3 months) (6, 12, 14, 195), and reevaluated whenever a change in local ventilation devices is made (12, 195, 207). See pp. 195-198 for methods of evaluation and for calculation of estimated airborne contaminant concentrations.

(d) Components of the chemical hygiene plan:

(i) Basic rules and procedures (recommendations for these are given in section (e), below).

(ii) Chemical procurement, distribution, and storage.

(A) Procurement. Before a substance is received, information on proper handling, storage, and disposal should be known to those who will be involved (215, 216). No container should be accepted without an adequate identifying label (216). Preferably, all substances should be received in a central location (216).

(B) Stockrooms/storerooms. Toxic substances should be segregated in a well-identified area with local exhaust ventilation (221). Chemicals which are highly toxic (227) or other chemicals whose containers have been opened should be in unbreakable secondary containers (219). Stored chemicals should be examined periodically (at least annually) for replacement, deterioration, and container integrity (218-19).

(C) Stockrooms/storerooms should not be used as preparation or repackaging areas, should be open during normal working hours, and should be controlled by one person (219).

(D) Distribution. When chemicals are hand carried, the container should be placed in an outside container or bucket. Freight-only elevators should be used if possible (223).

(E) Laboratory storage. Amounts permitted should be as small as practical. Storage on bench tops and in hoods is inadvisable. Exposure to heat or direct sunlight should be avoided. Periodic inventories should be conducted, with unneeded items being discarded or returned to the storeroom/stockroom (225-6, 229).

(iii) Environmental monitoring. Regular instrumental monitoring of airborne concentrations is not usually justified or practical in laboratories but may be appropriate when testing or redesigning hoods or other ventilation devices (12) or when a highly toxic substance is stored or used regularly (e.g., 3 times/week) (13).

(iv) Housekeeping, maintenance, and inspections.

(A) Cleaning. Floors should be cleaned regularly (24).

(B) Inspections. Formal housekeeping and chemical hygiene inspections should be held at least quarterly (6, 21) for units which have frequent personnel changes and semiannually for others; informal inspections should be continual (21).

(C) Maintenance. Eye wash fountains should be inspected at intervals of not less than 3 months (6). Respirators for routine use should be inspected periodically by the laboratory supervisor (169). Safety showers should be tested routinely (169). Other safety equipment should be inspected regularly. (E.g., every 3-6 months) (6, 24, 171). Procedures to prevent restarting of out-of-service equipment should be established (25).

(D) Passageways. Stairways and hallways should not be used as storage areas (24). Access to exits, emergency equipment, and utility controls should never be blocked (24).

(v) Medical program.

(A) Compliance with regulations. Regular medical surveillance should be established to the extent required by regulations (12).

(B) Routine surveillance. Anyone whose work involves regular and frequent handling of toxicologically significant quantities of a chemical should consult a qualified physician to determine on an individual basis whether a regular schedule of medical surveillance is desirable (11, 50).

(C) First aid. Personnel trained in first aid should be available during working hours and an emergency room with medical personnel should be nearby (173). See pp. 176-178 for description of some emergency first-aid procedures.

(vi) Protective apparel and equipment. These should include for each laboratory:

(A) Protective apparel compatible with the required degree of protection for substances being handled (158-161);

(B) An easily accessible drench-type safety shower (162, 169);

(C) An eyewash fountain (162);

(D) A fire extinguisher (162-164);

(E) Respiratory protection (164-9), fire alarm and telephone for emergency use (162) should be available nearby; and

(F) Other items designated by the laboratory supervisor (156, 160).

(vii) Records.

(A) Accident records should be written and retained (174).

(B) Chemical hygiene plan records should document that the facilities and precautions were compatible with current knowledge and regulations (7).

(C) Inventory and usage records for high-risk substances should be kept as specified in sections E3e below.

(D) Medical records should be retained by the institution in accordance with the requirements of state and federal regulations (12).

(viii) Signs and labels. Prominent signs and labels of the following types should be posted:

(A) Emergency telephone numbers of emergency personnel/facilities, supervisors, and laboratory workers (28);

(B) Identity labels, showing contents of containers (including waste receptacles) and associated hazards (27, 48);

(C) Location signs for safety showers, eyewash stations, other safety and first aid equipment, exits (27) and areas where food and beverage consumption and storage are permitted (24); and

(D) Warnings at areas or equipment where special or unusual hazards exist (27).

(ix) Spills and accidents.

(A) A written emergency plan should be established and communicated to all personnel; it should include procedures for ventilation failure (200), evacuation, medical care, reporting, and drills (172).

(B) There should be an alarm system to alert people in all parts of the facility including isolation areas such as cold rooms (172).

(C) A spill control policy should be developed and should include consideration of prevention, containment, cleanup, and reporting (175).

(D) All accidents or near accidents should be carefully analyzed with the results distributed to all who might benefit (8, 28).

(x) Information and training program.

(A) Aim: To assure that all individuals at risk are adequately informed about the work in the laboratory, its risks, and what to do if an accident occurs (5, 15).

(B) Emergency and personal protection training: Every laboratory worker should know the location and proper use of available protective apparel and equipment (154, 169).

(C) Some of the full-time personnel of the laboratory should be trained in the proper use of emergency equipment and procedures (6).

(D) Such training as well as first-aid instruction should be available to (154) and encouraged for (176) everyone who might need it.

(E) Receiving and stockroom/storeroom personnel should know about hazards, handling equipment, protective apparel, and relevant regulations (217).

(F) Frequency of training: The training and education program should be a regular, continuing activity—not simply an annual presentation (15).

(G) Literature/consultation: Literature and consulting advice concerning chemical hygiene should be readily available to laboratory personnel, who should be encouraged to use these information resources (14).

(xi) Waste disposal program.

(A) Aim: To assure that minimal harm to people, other organisms, and the environment will result from the disposal of waste laboratory chemicals (5).

(B) Content (14, 232, 233, 240): The waste disposal program should specify how waste is to be collected, segregated, stored, and transported and include consideration of what materials can be incinerated. Transport from the institution must be in accordance with DOT regulations (244).

(C) Discarding chemical stocks: Unlabeled containers of chemicals and solutions should undergo prompt disposal; if partially used, they should not be opened (24, 27).

(D) Before a worker's employment in the laboratory ends, chemicals for which that person was responsible should be discarded or returned to storage (226).

(E) Frequency of disposal: Waste should be removed from laboratories to a central waste storage area at least once per week and from the central waste storage area at regular intervals (14).

(F) Method of disposal: Incineration in an environmentally acceptable manner is the most practical disposal method for combustible laboratory waste (14, 238, 241).

(G) Indiscriminate disposal by pouring waste chemicals down the drain (14, 231, 242) or adding them to mixed refuse for landfill burial is unacceptable (14).

(H) Hoods should not be used as a means of disposal for volatile chemicals (40, 200).

(I) Disposal by recycling (233, 243) or chemical decontamination (40, 230) should be used when possible.

(e) Basic rules and procedures for working with chemicals. The chemical hygiene plan should require that laboratory workers know and follow its rules and procedures. In addition to the procedures of the subprograms mentioned above, these should include the general rules following:

(i) General rules. The following should be used for essentially all laboratory work with chemicals:

(A) Accidents and spills—Eye contact: Promptly flush eyes with water for a prolonged period (15 minutes) and seek medical attention (33, 172).

(B) Ingestion: Encourage the victim to drink large amounts of water (178).

(C) Skin contact: Promptly flush the affected area with water (33, 172, 178) and remove any contaminated clothing (172, 178). If symptoms persist after washing, seek medical attention (33).

(D) Clean-up. Promptly clean up spills, using appropriate protective apparel and equipment and proper disposal (24, 33). See pp. 233-237 for specific clean-up recommendations.

(E) Avoidance of "routine" exposure: Develop and encourage safe habits (23); avoid unnecessary exposure to chemicals by any route (23);

(F) Do not smell or taste chemicals (32). Vent apparatus which may discharge toxic chemicals (vacuum pumps, distillation columns, etc.) into local exhaust devices (199).

(G) Inspect gloves (157) and test glove boxes (208) before use.

(H) Do not allow release of toxic substances in cold rooms and warm rooms, since these have contained recirculated atmospheres (209).

(I) Choice of chemicals: Use only those chemicals for which the quality of the available ventilation system is appropriate (13).

(J) Eating, smoking, etc.: Avoid eating, drinking, smoking, gum chewing, or application of cosmetics in areas where laboratory chemicals are present (22, 24, 32, 40); wash hands before conducting these activities (23, 24).

(K) Avoid storage, handling, or consumption of food or beverages in storage areas, refrigerators, glassware, or utensils which are also used for laboratory operations (23, 24, 226).

(L) Equipment and glassware: Handle and store laboratory glassware with care to avoid damage; do not use damaged glassware (25). Use extra care with Dewar flasks and other evacuated glass apparatus; shield or wrap them to contain chemicals and fragments should implosion occur (25). Use equipment only for its designed purpose (23, 26).

(M) Exiting: Wash areas of exposed skin well before leaving the laboratory (23).

(N) Horseplay: Avoid practical jokes or other behavior which might confuse, startle, or distract another worker (23).

(O) Mouth suction: Do not use mouth suction for pipetting or starting a siphon (23, 32).

(P) Personal apparel: Confine long hair and loose clothing (23, 158). Wear shoes at all times in the laboratory but do not wear sandals, perforated shoes, or sneakers (158).

(Q) Personal housekeeping: Keep the work area clean and uncluttered, with chemicals and equipment being properly labeled and stored; clean up the work area on completion of an operation or at the end of each day (24).

(R) Personal protection: Assure that appropriate eye protection (154-156) is worn by all persons, including visitors, where chemicals are stored or handled (22, 23, 33, 154).

(S) Wear appropriate gloves when the potential for contact with toxic materials exists (157); inspect the gloves before each use, wash them before removal, and replace them periodically (157). (A table of resistance to chemicals of common glove materials is given p. 159.)

(T) Use appropriate (164-168) respiratory equipment when air contaminant concentrations are not sufficiently restricted by engineering controls (164-5), inspecting the respirator before use (169).

(U) Use any other protective and emergency apparel and equipment as appropriate (22, 157-162).

(V) Void use of contact lenses in the laboratory unless necessary; if they are used, inform supervisor so special precautions can be taken (155).

(W) Remove laboratory coats immediately on significant contamination (161).

(X) Planning: Seek information and advice about hazards (7), plan appropriate protective procedures, and plan positioning of equipment before beginning any new operation (22, 23).

(Y) Unattended operations: Leave lights on, place an appropriate sign on the door, and provide for containment of toxic substances in the event of failure of a utility service (such as cooling water) to an unattended operation (27, 128).

(Z) Use of hood: Use the hood for operations which might result in release of toxic chemical vapors or dust (198-9).

(AA) As a rule of thumb, use a hood or other local ventilation device when working with any appreciably volatile substance with a TLV of less than 50 ppm (13).

(BB) Confirm adequate hood performance before use; keep hood closed at all times except when adjustments within the hood are being made (200); keep materials stored in hoods to a minimum and do not allow them to block vents or air flow (200).

(CC) Leave the hood "on" when it is not in active use if toxic substances are stored in it or if it is uncertain whether adequate general laboratory ventilation will be maintained when it is "off" (200).

(DD) Vigilance: Be alert to unsafe conditions and see that they are corrected when detected (22).

(EE) Waste disposal: Assure that the plan for each laboratory operation includes plans and training for waste disposal (230).

(FF) Deposit chemical waste in appropriately labeled receptacles and follow all other waste disposal procedures of the chemical hygiene plan (22, 24).

(GG) Do not discharge to the sewer concentrated acids or bases (231); highly toxic, malodorous, or lachrymatory substances (231); or any substances which might interfere with the biological activity of waste water treatment plants, create fire or explosion hazards, cause structural damage, or obstruct flow (242).

(HH) Working alone: Avoid working alone in a building; do not work alone in a laboratory if the procedures being conducted are hazardous (28).

(ii) Working with allergens and embryotoxins.

(A) Allergens (examples: Diazomethane, isocyanates, bichromates): Wear suitable gloves to prevent hand contact with allergens or substances of unknown allergenic activity (35).

(B) Embryotoxins (34-5) (examples: Organomercurials, lead compounds, formamide): Women of childbearing age shall handle these substances only in a hood whose satisfactory performance has been confirmed, using appropriate protective apparel (especially gloves) to prevent skin contact.

(C) Review each use of these materials with the research supervisor and review continuing uses annually or whenever a procedural change is made.

(D) Store these substances, properly labeled, in an adequately ventilated area in an unbreakable secondary container.

(E) Notify supervisors of all incidents of exposure or spills; consult a qualified physician when appropriate.

(iii) Work with chemicals of moderate chronic or high acute toxicity.

Examples: diisopropylfluorophosphate (41), hydrofluoric acid (43), hydrogen cyanide (45).

(iv) Supplemental rules to be followed in addition to those mentioned above (Procedure B of "prudent practices," pp. 39-41):

(A) Aim: To minimize exposure to these toxic substances by any route using all reasonable precautions (39).

(B) Applicability: These precautions are appropriate for substances with moderate chronic or high acute toxicity used in significant quantities (39).

(C) Location: Use and store these substances only in areas of restricted access with special warning signs (40, 229).

(D) Always use a hood (previously evaluated to confirm adequate performance with a face velocity of at least 60 linear feet per minute) (40) or other containment device for procedures which may result in the generation of aerosols or vapors containing the substance (39); trap released vapors to prevent their discharge with the hood exhaust (40).

(E) Personal protection: Always avoid skin contact by use of gloves and long sleeves (and other protective apparel as appropriate) (39). Always wash hands and arms immediately after working with these materials (40).

(F) Records: Maintain records of the amounts of these materials on hand, amounts used, and the names of the workers involved (40, 229).

(G) Prevention of spills and accidents: Be prepared for accidents and spills (41).

(H) Assure that at least 2 people are present at all times if a compound in use is highly toxic or of unknown toxicity (39).

(I) Store breakable containers of these substances in chemically resistant trays; also work and mount apparatus above such trays or cover work and storage surfaces with removable, absorbent, plastic backed paper (40).

(J) If a major spill occurs outside the hood, evacuate the area; assure that cleanup personnel wear suitable protective apparel and equipment (41).

(K) Waste: Thoroughly decontaminate or incinerate contaminated clothing or shoes (41). If possible, chemically decontaminate by chemical conversion (40).

(L) Store contaminated waste in closed, suitably labeled, impervious containers (for liquids, in glass or plastic bottles half-filled with vermiculite) (40).

(v) Work with chemicals of high chronic toxicity.

Examples: Dimethylmercury and nickel carbonyl (48), benzo-a-pyrene (51), N-nitrosodiethylamine (54), other human carcinogens or substances with high carcinogenic potency in animals (38).

(vi) Further supplemental rules to be followed, in addition to all these mentioned above, for work with substances of known high chronic toxicity (in quantities above a few

milligrams to a few grams, depending on the substance) (47). (Procedure A of "Prudent Practices" pp. 47-50).

(A) Access: Conduct all transfers and work with these substances in a "controlled area": A restricted access hood, glove box, or portion of a lab, designated for use of highly toxic substances, for which all people with access are aware of the substances being used and necessary precautions (48).

(B) Approvals: Prepare a plan for use and disposal of these materials and obtain the approval of the laboratory supervisor (48).

(C) Noncontamination/decontamination: Protect vacuum pumps against contamination by scrubbers or HEPA filters and vent them into the hood (49). Decontaminate vacuum pumps or other contaminated equipment, including glassware, in the hood before removing them from the controlled area (49, 50).

(D) Decontaminate the controlled area before normal work is resumed there (50).

(E) Exiting: On leaving a controlled area, remove any protective apparel (placing it in an appropriate, labeled container) and thoroughly wash hands, forearms, face, and neck (49).

(F) Housekeeping: Use a wet mop or a vacuum cleaner equipped with a HEPA filter instead of dry sweeping if the toxic substance was a dry powder (50).

(G) Medical surveillance: If using toxicologically significant quantities of such a substance on a regular basis (e.g., 3 times per week), consult a qualified physician concerning desirability of regular medical surveillance (50).

(H) Records: Keep accurate records of the amounts of these substances stored (229) and used, the dates of use, and names of users (48).

(I) Signs and labels: Assure that the controlled area is conspicuously marked with warning and restricted access signs (49) and that all containers of these substances are appropriately labeled with identity and warning labels (48).

(J) Spills: Assure that contingency plans, equipment, and materials to minimize exposures of people and property in case of accident are available (233-4).

(K) Storage: Store containers of these chemicals only in a ventilated, limited access (48, 227, 229) area in appropriately labeled, unbreakable, chemically resistant, secondary containers (48, 229).

(L) Glove boxes: For a negative pressure glove box, ventilation rate must be at least 2 volume changes/hour and pressure at least 0.5 inches of water (48). For a positive pressure glove box, thoroughly check for leaks before each use (49). In either case, trap the exit gases or filter them through a HEPA filter and then release them into the hood (49).

(M) Waste: Use chemical decontamination whenever possible; ensure that containers of contaminated waste (including washings from contaminated flasks) are transferred from the controlled area in a secondary container under the supervision of authorized personnel (49, 50, 233).

(vii) Animal work with chemicals of high chronic toxicity.

(A) Access: For large scale studies, special facilities with restricted access are preferable (56).

(B) Administration of the toxic substance: When possible, administer the substance by injection or gavage instead

of in the diet. If administration is in the diet, use a caging system under negative pressure or under laminar air flow directed toward HEPA filters (56).

(C) Aerosol suppression: Devise procedures which minimize formation and dispersal of contaminated aerosols, including those from food, urine, and feces (e.g., use HEPA filtered vacuum equipment for cleaning, moisten contaminated bedding before removal from the cage, mix diets in closed containers in a hood) (55, 56).

(D) Personal protection: When working in the animal room, wear plastic or rubber gloves, fully buttoned laboratory coat or jumpsuit and, if needed because of incomplete suppression of aerosols, other apparel and equipment (shoe and head coverings, respirator) (56).

(E) Waste disposal: Dispose of contaminated animal tissues and excreta by incineration if the available incinerator can convert the contaminant to nontoxic products (238); otherwise, package the waste appropriately for burial in an EPA-approved site (239).

(f) Safety recommendations. The above recommendations from "prudent practices" do not include those which are directed primarily toward prevention of physical injury rather than toxic exposure. However, failure of precautions against injury will often have the secondary effect of causing toxic exposures. Therefore, we list below page references for recommendations concerning some of the major categories of safety hazards which also have implications for chemical hygiene:

(i) Corrosive agents: (35-6)

(ii) Electrically powered laboratory apparatus: (179-92)

(iii) Fires, explosions: (26, 57-74, 162-4, 174-5, 219-20, 226-7)

(iv) Low temperature procedures: (26, 88)

(v) Pressurized and vacuum operations (including use of compressed gas cylinders): (27, 75-101)

(g) Material safety data sheets. Material safety data sheets are presented in "prudent practices" for the chemicals listed below. (Asterisks denote that comprehensive material safety data sheets are provided.)

*Acetyl peroxide (105) *Acrolein (106) *Acrylonitrile (107) Ammonia (anhydrous) (91) *Aniline (109) *Benzene (110) *Benzo[a]pyrene (112) *Bis(chloromethyl) ether (113) Boron trichloride (91) Boron trifluoride (92) Bromine (114) *Tert-butyl hydroperoxide (148) *Carbon disulfide (116) Carbon monoxide (92) *Carbon tetrachloride (118) *Chlorine (119) Chlorine trifluoride (94) *Chloroform (121) Chloromethane (93) *Diethyl ether (122) Diisopropyl fluorophosphate (41) *Dimethylformamide (123) *Dimethyl sulfate (125) *Dioxane (126) *Ethylene dibromide (128) *fluorine (95) *Formaldehyde (130) *Hydrazine and salts (132) Hydrofluoric acid (43) Hydrogen bromide (98) Hydrogen chloride (98) *Hydrogen cyanide (133) *Hydrogen sulfide (135) Mercury and compounds (52) *Methanol (137) *Morpholine (138) *Nickel carbonyl (99) *Nitrobenzene (139) Nitrogen dioxide (100) N-nitrosodiethylamine (54) *Peracetic acid (141) *Phenol (142) *Phosgene (143) *Pyridine (144) *Sodium azide (145) *Sodium cyanide (147) Sulfur dioxide (101) *Trichloroethylene (149) *Vinyl chloride (150)

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-62-40025, filed 7/20/94, effective 9/20/94; 90-17-051 (Order 90-10), § 296-62-40025, filed 8/13/90, effective 9/24/90.]

WAC 296-62-40027 Appendix B—References (non-mandatory). (1) The following references are provided to assist the employer in the development of a chemical hygiene plan. The materials listed below are offered as nonmandatory guidance. References listed here do not imply specific endorsement of a book, opinion, technique, policy, or a specific solution for a safety or health problem. Other references not listed here may better meet the needs of a specific laboratory. Reference materials for the development of the chemical hygiene plan are:

(a) *American Chemical Society, Safety in Academic Chemistry Laboratories, 4th edition, 1985.*

(b) *Fawcett, H.H. and W. S. Wood, Safety and Accident Prevention in Chemical Operations, 2nd edition, Wiley-Interscience, New York, 1982.*

(c) *Flury, Patricia A., Environmental Health and Safety in the Hospital Laboratory, Charles C. Thomas Publisher, Springfield IL, 1978.*

(d) *Green, Michael E. and Turk, Amos, Safety in Working with Chemicals, Macmillan Publishing Co., NY, 1978.*

(e) *Kaufman, James A., Laboratory Safety Guidelines, Dow Chemical Co., Box 1713, Midland, MI 48640, 1977.*

(f) *National Institutes of Health, NIH Guidelines for the Laboratory use of Chemical Carcinogens, NIH Pub. No. 81-2385, GPO, Washington, DC 20402, 1981.*

(g) *National Research Council, Prudent Practices for Disposal of Chemicals from Laboratories, National Academy Press, Washington, DC, 1983.*

(h) *National Research Council, Prudent Practices for Handling Hazardous Chemicals in Laboratories, National Academy Press, Washington, DC, 1981.*

(i) *Renfrew, Malcolm, Ed., Safety in the Chemical Laboratory, Vol. IV, J. Chem. Ed., American Chemical Society, Easlon, PA, 1981.*

(j) *Steere, Norman V., Ed., Safety in the Chemical Laboratory, J. Chem. Ed. American Chemical Society, Easlon, PA, 18042, Vol. I, 1967, Vol. II, 1971, Vol. III 1974.*

(k) *Steere, Norman V., Handbook of Laboratory Safety, the Chemical Rubber Company Cleveland, OH, 1971.*

(l) *Young, Jay A., Ed., Improving Safety in the Chemical Laboratory, John Wiley & Sons, Inc. New York, 1987.*

(2) Hazardous substances information:

(a) *American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment with Intended Changes, P.O. Box 1937 Cincinnati, OH 45201 (latest edition).*

(b) *Annual Report on Carcinogens, National Toxicology Program U.S. Department of Health and Human Services, Public Health Service, U.S. Government Printing Office, Washington, DC, (latest edition).*

(c) *Best Company, Best Safety Directory, Vols. I and II, Oldwick, N.J., 1981.*

(d) *Bretherick, L., Handbook of Reactive Chemical Hazards, 2nd edition, Butterworths, London, 1979.*

(e) *Bretherick, L., Hazards in the Chemical Laboratory, 3rd edition, Royal Society of Chemistry, London, 1986.*

(f) *Code of Federal Regulations, 29 CFR part 1910 subpart Z. U.S. Govt. Printing Office, Washington, DC 20402 (latest edition).*

(g) *IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, World Health Organization Publications Center, 49 Sheridan Avenue, Albany, New York 12210 (latest editions).*

(h) *NIOSH/OSHA Pocket Guide to Chemical Hazards. NIOSH Pub. No. 85-114, U.S. Government Printing Office, Washington, DC, 1985 (or latest edition).*

(i) *Occupational Health Guidelines, NIOSH/OSHA NIOSH Pub. No. 81-123 U.S. Government Printing Office, Washington, DC, 1981.*

(j) *Patty, F.A., Industrial Hygiene and Toxicology, John Wiley & Sons, Inc., New York, NY (Five Volumes).*

(k) *Registry of Toxic Effects of Chemical Substances, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, Revised Annually, for sale from Superintendent of Documents U.S. Govt. Printing Office, Washington, DC 20402.*

(l) *The Merck Index: An Encyclopedia of Chemicals and Drugs. Merck and Company Inc. Rahway, N.J., 1976 (or latest edition).*

(m) *Sax, N.I. Dangerous Properties of Industrial Materials, 5th edition, Van Nostrand Reinhold, NY., 1979.*

(n) *Sittig, Marshall, Handbook of Toxic and Hazardous Chemicals, Noyes Publications, Park Ridge, NJ, 1981.*

(3) Information on ventilation:

(a) *American Conference of Governmental Industrial Hygienists Industrial Ventilation, 16th edition Lansing, MI, 1980.*

(b) *American National Standards Institute, Inc. American National Standards Fundamentals Governing the Design and Operation of Local Exhaust Systems ANSI Z 9.2-1979 American National Standards Institute, N.Y. 1979.*

(c) *Imad, A.P. and Watson, C.L. Ventilation Index: An Easy Way to Decide about Hazardous Liquids, Professional Safety pp 15-18, April 1980.*

(d) *National Fire Protection Association, Fire Protection for Laboratories Using Chemicals NFPA-45, 1982.*

(e) *Safety Standard for Laboratories in Health Related Institutions, NFPA, 56c, 1980.*

(f) *Fire Protection Guide on Hazardous Materials, 7th edition, 1978.*

(g) *National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.*

(h) *Scientific Apparatus Makers Association (SAMA), Standard for Laboratory Fume Hoods, SAMA LF7-1980, 1101 16th Street, NW., Washington, DC 20036.*

(4) Information on availability of referenced material:

(a) *American National Standards Institute (ANSI), 1430 Broadway, New York, NY 10018.*

(b) *American Society for Testing and Materials (ASTM), 1916 Race Street, Philadelphia, PA 19103. (Approved by the Office of Management and Budget under control number 1218-0131.)*

[Statutory Authority: Chapter 49.17 RCW. 90-17-051 (Order 90-10), § 296-62-40027, filed 8/13/90, effective 9/24/90.]

(1999 Ed.)

Chapter 296-63 WAC

RIGHT TO KNOW FEE ASSESSMENT

WAC

296-63-001	Purpose and scope.
296-63-003	Definitions.
296-63-005	Selected industries.
296-63-007	Fee assessment.
296-63-009	Exemption requests.
296-63-011	Fraudulent exemption requests.
296-63-013	Appeals.
296-63-015	Fee assessment not received.

WAC 296-63-001 Purpose and scope. This chapter establishes a fee assessment under the Worker and Community Right to Know Act in accordance with RCW 49.70.170.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-001, filed 11/6/86.]

WAC 296-63-003 Definitions. Unless the context clearly requires otherwise, the definitions of this section shall apply throughout this chapter.

(1) "Department" means the department of labor and industries.

(2) "Director" means the director of the department of labor and industries or his/her designee.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-003, filed 11/6/86.]

WAC 296-63-005 Selected industries. Fees shall only be assessed to employers engaged in business operations having a standard industrial classification, as designated in the standard industrial classification manual prepared by the federal Office of Management and Budget, within the following major groups:

(1) Numbers 01 through 08 (agriculture and forestry industries).

(2) Numbers 10 through 14 (mining industries).

(3) Numbers 15 through 17 (construction industries).

(4) Numbers 20 through 39 (manufacturing industries).

(5) Numbers 41, 42, and 44 through 49 (transportation, communications, electric, gas, and sanitary services).

(6) Number 75 (automotive repair services, and garages).

(7) Number 76 (miscellaneous repair services).

(8) Number 80 (health services).

(9) Number 82 (educational services).

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-005, filed 11/6/86.]

WAC 296-63-007 Fee assessment. (1) The department shall assess an annual fee to each employer in the selected industries identified in WAC 296-63-003.

(2) The fee shall only be assessed to employers who reported ten thousand four hundred or more worker hours to the department.

(3) The fee assessment shall be based on reported worker hours for the prior calendar year.

(4) One full-time equivalent employee is equal to two thousand eighty worker hours.

(5) The fee assessment shall be two dollars and fifty cents for each full-time equivalent employee. Any fraction of a full-time equivalent employee shall be counted as one full-time equivalent employee.

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(6) The annual fee shall not exceed fifty thousand dollars for an individual employer.

(7) All fees collected by the department shall be deposited in the worker and community right to know fund.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-007, filed 11/6/86.]

WAC 296-63-009 Exemption requests. (1) Employers who do not have hazardous chemicals at their workplace may submit a written request for exemption to the department. Submission of an exemption request does not relieve an employer of his/her obligation to pay the fee assessment until such time as the request is approved. Employers granted exemptions will be removed from the listing of employers to be assessed a fee beginning with the current billing period.

(2) Exemptions shall only be considered for an employer's entire workplace consisting of all activities reported to the department under the same employer identification number.

(3) Each request for exemption must contain the following information:

- (a) Firm name and employer identification number;
- (b) Complete mailing address;
- (c) Complete location (such as street) address;

(d) A certified statement in the form required by RCW 9A.72.085 that a hazardous chemical survey of the employer's premises has been completed by a qualified person, the identity and qualifications of the person completing the survey, and that no hazardous chemicals as defined by WAC 296-62-054 through 296-62-05427 are present at the workplace.

(4) The department may schedule an on-site inspection to determine the validity of the exemption request.

(5) The employer shall provide to the department within five working days of receiving a request from the department, any additional information identified by the department as necessary for evaluating the exemption request.

(6) Exemption requests shall be mailed to:

Right to Know Program
Department of Labor and Industries
P.O. Box 44620
Olympia, Washington 98504-4620

[Statutory Authority: RCW 49.70.170 and 49.17.040. 98-02-029, § 296-63-009, filed 12/31/97, effective 1/31/98. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-009, filed 11/6/86.]

WAC 296-63-011 Fraudulent exemption requests. (1) The department may assess a civil penalty against any employer who submits a fraudulent exemption request. Such penalty assessment shall be consistent with RCW 49.17.180(1), and shall not exceed seventy thousand dollars.

(2) In addition, the director may cause a record of such fraudulent exemptions submission to be referred to the prosecuting attorney of the county wherein such submission occurred.

[Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-63-011, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-011, filed 11/6/86.]

WAC 296-63-013 Appeals. An employer may appeal the fee assessment or penalties in accordance with RCW 49.70.170(4).

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-013, filed 11/6/86.]

WAC 296-63-015 Fee assessment not received. When fee assessments are not received by the department, penalties shall be assessed to the delinquent employer in accordance with chapter 49.70 RCW and RCW 49.70.177.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-23-003 (Order 86-38), § 296-63-015, filed 11/6/86.]

Chapter 296-65 WAC

ASBESTOS REMOVAL AND ENCAPSULATION

WAC

296-65-001	Purpose and scope.
296-65-003	Definitions.
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296-65-010	Asbestos worker certification.
296-65-012	Asbestos supervisor certification.
296-65-015	Training course approval.
296-65-017	Contractor certification.
296-65-020	Notification requirements.
296-65-025	Fees.
296-65-030	Methods of compliance.
296-65-035	Reciprocity.
296-65-050	Denial, suspension, and revocation of certificates.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-65-040	Appeals—Notice and filing. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-65-040, filed 4/27/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-040, filed 10/22/85.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-65-045	Appeals—Procedure. [Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-045, filed 10/22/85.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.

WAC 296-65-001 Purpose and scope. This standard regulates asbestos removal and encapsulation, requires contractor certification, specifies minimum training for supervisors and workers on asbestos projects, requires notification of asbestos projects, and establishes a training course approval program. This standard applies to the removal or encapsulation of any materials containing more than one percent asbestos.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 97-19-014, § 296-65-001, filed 9/5/97, effective 11/5/97. Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-001, filed 10/10/89, effective 11/24/89. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-001, filed 10/22/85.]

WAC 296-65-003 Definitions. Unless the context clearly requires otherwise, the definitions in this section apply throughout this standard.

"Approved" means approved by the department.

"Asbestos" includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, and actinolite asbestos, and any of these minerals that have been chemically treated and/or altered.

"Asbestos fiber" means asbestos fiber as defined in WAC 296-62-07703.

"Asbestos abatement project" means an asbestos project involving three square feet or three linear feet, or more, of asbestos containing material.

"Asbestos project" includes the construction, demolition, repair, remodeling, maintenance or renovation of any public or private building or structure, mechanical piping equipment or system involving the demolition, removal, encapsulation, salvage, or disposal of material or outdoor activity releasing or likely to release asbestos fibers into the air. Removal of intact vinyl asbestos tile (VAT), and intact roofing materials is excluded from this definition, unless these items are removed by mechanical methods such as chipping, grinding, sanding, or sawing. Also excluded is any project in which there is a disturbance of asbestos of less than one square foot of total surface area of asbestos-containing material (ACM), but this latter exclusion does not pertain to any disturbance of asbestos during a project dealing with pipe insulation. Also excluded from this definition is work on asbestos-cement water pipe provided such work is done in accordance with the latest edition of "Recommended Standard Asbestos-Cement Pipe Work Practice Procedures and Training Requirements" adopted and published by the Pacific Northwest Section of the American Water Works Association and as approved by the department.

"Certified asbestos contractor" means any partnership, firm, association, corporation or sole proprietorship, registered under chapter 18.27 RCW, that submits a bid, or contracts to remove or encapsulate asbestos for another and is certified by the department to remove or encapsulate asbestos.

"Certificate" means a certificate issued by the department that shall include the name of person awarded the certificate, certificate number, the discipline for which certification was conferred, training and examination dates, the course provider's name and address, and the course provider's telephone number, expiration date, and a statement that the person receiving the certificate has completed the training for asbestos accreditation under TSCA Title II.

"Certified asbestos supervisor" means an individual who is certified by the department under WAC 296-65-012.

"Certified asbestos worker" means an individual certified by the department under WAC 296-65-010.

"Department" means the department of labor and industries.

"Demolition" means the activity of razing a structure which includes the wrecking, removal, or dismantling of any load-supporting structural member of any facility including any related handling operations.

"Direct on-site supervision" means the supervision of no more than three workers by a certified asbestos supervisor who is physically present at all times at the asbestos project. It includes the authority to immediately correct any deficiencies on the project.

"Director" means the director of the department of labor and industries or the director's designee.

"Emergency project" means a project that was not planned but results from a sudden, unexpected event and

includes operations which are necessitated by nonroutine failures of equipment or systems.

"Encapsulation" means the application of an encapsulant to asbestos containing materials to control the release of asbestos fibers into the air. The encapsulation process either creates a membrane over the surface (bridging encapsulant) or penetrates the material and binds its components together (penetrating encapsulant).

"EPA MAP" means the environmental protection agency model accreditation plan for asbestos requirements in 40 CFR Part 763.

"HEPA filtration" means high-efficiency particulate air filtration found in respirators and vacuum systems capable of filtering 0.3 micron particles with 99.97% efficiency.

"Intact" means that the asbestos containing material has not crumbled, been pulverized, or otherwise deteriorated so that it is no longer likely to be bound with its matrix.

"NESHAP" means the National Emission Standards for Hazardous Air Pollutants.

"Owner" means the person who owns any public or private building, structure, facility, or mechanical system, or the remnants thereof, or the agent of such person, but does not include individuals who work on asbestos projects in their own single-family residences, no part of which is used for commercial purposes.

"Person" means any individual, partnership, firm, association, corporation, sole proprietorship, or the state of Washington or its political subdivisions.

"Revocation" means a permanent withdrawal of a certification issued by the department.

"Suspension" means a temporary withdrawal of a certification issued by the department. No suspension shall be less than six months or longer than one year.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-05-056, § 296-65-003, filed 2/16/96, effective 4/1/96. Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-003, filed 10/10/89, effective 11/24/89; 87-24-051 (Order 87-24), § 296-65-003, filed 11/30/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-003, filed 10/22/85.]

WAC 296-65-005 Asbestos worker training course content. An approved asbestos worker training course shall consist of four days of training with a minimum of thirty-two hours. This initial training course shall provide, at a minimum, information on the following topics:

(1) The physical characteristics of asbestos including types, fiber size, aerodynamic characteristics and physical appearance.

(2) Examples of different types of asbestos and asbestos-containing materials. Real asbestos shall be used only for observation by trainees and shall be enclosed in sealed unbreakable containers.

(3) The health hazards of asbestos including the nature of asbestos related diseases, routes of exposure, dose-response relationships, synergism between cigarette smoking and asbestos exposure, latency period of diseases, hazards to immediate family, and the health basis for asbestos standards.

(4) Employee personal protective equipment including the classes and characteristics of respirator types, limitations of respirators, proper selection, inspection, donning, use, maintenance and storage procedure, methods for field check-

ing of the facepiece-to-face seal (positive and negative-pressure checks), qualitative and quantitative fit testing procedures, variability between field and laboratory protection factors, factors that alter respirator fit (e.g., eye glasses and facial hair), the components of a proper respiratory protection program, respirator program administrator, requirements on oil lubricated reciprocating piston compressors for breathing air, and selection and use of personal protective clothing. Qualitative or quantitative fit testing shall be performed on at least one student for demonstration purposes and in accordance with WAC 296-62-07715 and 296-62-07739.

(5) Use, storage and handling of launderable clothing, nonslip footwear, gloves, eye protection and hard hats.

(6) Medical monitoring procedures and requirements, including the provisions of WAC 296-62-071 through 296-62-07121 and 296-62-07725, any additional recommended procedures and tests, benefits of medical monitoring and employee access to records.

(7) Air monitoring procedures and requirements specified in WAC 296-62-07709, including a description of equipment, sampling methods and strategies, reasons for air monitoring, types of samples, including area, personal and clearance samples, current standards with proposed changes if any, employee observation and notification, recordkeeping and employee access to records, interpretation of air monitoring results, and analytical methods for bulk and air samples.

(8) State-of-the-art work practices for asbestos removal and encapsulation activities including purpose, proper construction and maintenance of barriers and decontamination enclosure systems, posting of warning signs, electrical and ventilation system lock-out, proper working techniques and tools with vacuum attachments for minimizing fiber release, use of wet methods and surfactants, use of negative-pressure ventilation equipment for minimizing employee exposure to asbestos fibers and contamination prevention, scoring and breaking techniques for rigid asbestos products, glove bag techniques, recommended and prohibited work practices, potential exposure situations, emergency procedures for sudden releases, use of HEPA vacuums and proper clean-up and disposal procedures. Work practice requirements for removal, encapsulation, enclosure, repair, and waste transportation shall be discussed individually. Appropriate work practices for both indoor and outdoor asbestos projects shall be included.

(9) Personal hygiene including entry and exit procedures for the work area, use of showers and prohibition of eating, drinking, smoking and chewing (gum or tobacco) in the work area. Potential exposures, such as family exposure shall also be included.

(10) Additional safety hazards that may be encountered during asbestos removal and encapsulation activities and hazard abatement, including electrical hazards, scaffold and ladder hazards, slips, trips and falls, confined spaces, noise, and heat stress.

(11) The requirements, procedures and standards established by:

(a) The Environmental Protection Agency, 40 CFR Part 61, Subparts A and M, and 40 CFR Part 763.

(b) Washington state department of ecology.

(c) Local air pollution control agencies.

(d) Washington state department of labor and industries, division of industrial safety and health, chapter 49.17 RCW (Washington Industrial Safety and Health Act), chapter 49.26 RCW (Health and safety—Asbestos), and ensuing regulations.

(12) Actual worksite considerations.

(13) The instruction required by this section shall include, at a minimum fourteen hours of hands-on training for the following:

(a) Glove bag techniques;

(b) The opportunity to don respirators including half facepiece and full facepiece air purifying respirators, powered air purifying respirators (PAPR), and Type-C supplied-air respirators;

(c) Removal of sprayed-on or troweled-on material, and pipe lagging;

(d) Basic construction of a decontamination unit, and proper entry and exit;

(e) Suit-up in protective clothing consisting of coveralls, foot coverings and head coverings.

(14) Course review, a review of the key aspects of the training course.

(15) Asbestos-containing materials shall not be used for hands-on training.

(16) In recognition that asbestos abatement is an evolving industry, the department reserves the right to require additional subjects to be taught and to specify the amount of time which shall be allotted to adequately cover required subjects. To assure adequate coverage of required material, each sponsor shall be provided and required to incorporate into the training course, a detailed outline of subject matter developed by the department.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-05-056, § 296-65-005, filed 2/16/96, effective 4/1/96. Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-005, filed 10/10/89, effective 11/24/89; 87-24-051 (Order 87-24), § 296-65-005, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-65-005, filed 4/27/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-005, filed 10/22/85.]

WAC 296-65-007 Asbestos supervisor training course content. An approved asbestos supervisor training course shall consist of at least five days of training. This initial training course shall include lectures, demonstrations, at least fourteen hours of hands-on training, course review and a written examination. Audio-visual materials, where appropriate, are recommended to complement lectures. The training course shall provide, at a minimum, information on the following topics:

(1) The physical characteristics of asbestos and asbestos-containing materials including identification of asbestos, aerodynamic characteristics, typical uses, physical appearance, hazard assessment considerations, and a summary of abatement control options.

(2) Health effects related to asbestos exposure including the nature of asbestos related diseases, routes of exposure, dose-response relationships and the lack of a safe level of exposure, synergism between asbestos exposure and cigarette smoking, latency period, hazards to the immediate family and the health basis for the standard.

(3) Employee personal protective equipment including the classes and characteristics of respirator types, limitations of respirators, proper selection, inspection, donning, use, maintenance, and storage procedures, methods for field checking of the facepiece-to-face seal (positive and negative pressure checks), variability between field and laboratory protection factors, quantitative and qualitative fit test requirements, factors that alter respirator fit (facial hair, scars, etc.), the components of a proper respirator program, requirements for oil lubricated reciprocating compressors, maintenance of Type-C systems, standards for breathing air, selection and use of personal protective clothing, use, storage, and handling of nondisposable clothing, and regulations covering personal protective equipment.

(4) State-of-the-art work practices for asbestos removal and encapsulation activities including purpose, proper construction and maintenance of barriers and decontamination enclosure systems, posting of warning signs, electrical and ventilation system lock-out, proper working techniques and tools with vacuum attachments for minimizing fiber release, use of wet methods and surfactants, use of negative-pressure ventilation equipment for minimizing employee exposure to asbestos fibers and contamination prevention, scoring and breaking techniques for rigid asbestos products, glove bag techniques, recommended and prohibited work practices, potential exposure situations, emergency procedures for sudden releases, use of HEPA vacuums and proper clean-up and disposal procedures. Work practice requirements for removal, encapsulation, and repair shall be discussed separately. Appropriate work practices for both indoor and outdoor asbestos projects shall be included.

(5) Personal hygiene including entry and exit procedures for the work area, use of showers and prohibition of eating, drinking, smoking, and chewing (gum and tobacco) in the work area. Potential exposures, such as family exposure shall also be included.

(6) Additional safety hazards that may be encountered during asbestos abatement activities and how to deal with them, including electrical hazards, heat stress, air contaminants other than asbestos, fire and explosion hazards, scaffold and ladder hazards, slips, trips, and falls, confined space entry requirements, and noise hazards.

(7) Medical monitoring procedures and requirements, including the provisions of WAC 296-62-071 through 296-62-07121 and 296-62-07725, any additional recommended procedures and tests, benefits of medical monitoring and recordkeeping requirements.

(8) Air monitoring procedures and requirements specified in WAC 296-62-07709, including a description of equipment, sampling methods and strategies, reasons for air monitoring, types of samples, including area, personal and clearance samples, a description of aggressive sampling, current standards with proposed changes if any, employee observation and notification, recordkeeping, interpretation of air monitoring results, specifically from analyses performed by polarized light, phase contrast, and electron microscopy.

(9) The requirements, procedures, and standards established by:

(a) The Environmental Protection Agency, 40 CFR Part 61, Subparts A and M, and 40 CFR Part 763.

(1999 Ed.)

(b) The Washington state department of ecology.

(c) Local air pollution control agencies.

(d) Washington state department of labor and industries, division of industrial safety and health, chapter 49.17 RCW (Washington Industrial Safety and Health Act), chapter 49.26 RCW (Health and safety—Asbestos), and ensuing regulations.

(10) Actual worksite considerations.

(11) Insurance and liability issues including contractor issues, industrial insurance coverage and exclusions, third party liabilities and defenses, private insurance coverage and exclusions, recordkeeping recommended for legal and insurance purposes.

(12) Supervisory techniques for asbestos abatement projects including supervisory practices to enforce and reinforce the required work practices and discourage unsafe work practices.

(13) Contract specifications including a discussion of the key elements to be included in contract specifications.

(14) A minimum of fourteen hours of hands-on training for the following:

(a) Calibration of air-sampling equipment;

(b) Routine maintenance of air-purifying and air-supplied respirators;

(c) Setup of a decontamination unit including calculating the number of negative air machines needed as well as proper placement of the machines within the enclosure; and

(d) Quantitative and qualitative fit-testing protocols.

(15) Course review, a review of the key aspects of the training course.

(16) In recognition that asbestos abatement is an evolving industry, the department reserves the right to require additional subjects to be taught and to specify the amount of time which shall be allotted to adequately cover required subjects. To assure adequate coverage of required material, each sponsor shall be provided and required to incorporate into their training course, a detailed outline of subject matter developed by the department.

[Statutory Authority: RCW 49.17.040, [49.17.1050 and [49.17.1060. 96-05-056, § 296-65-007, filed 2/16/96, effective 4/1/96. Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-007, filed 10/10/89, effective 11/24/89.]

WAC 296-65-010 Asbestos worker certification. (1)

For the purposes of this section "individual" means any natural person.

(2) To qualify for an asbestos worker certificate, an individual must do the following:

(a) Successfully complete an approved asbestos worker training course;

(b) Achieve a score of at least seventy percent on a one hundred question multiple choice closed book examination approved by the department but administered by the training course sponsor;

(c) Submit to the department a timely application validated by an approved training course sponsor. To be considered timely, an application must be received by the department not later than sixty days after the completion of the course. In the event that an application is not timely, the individual shall be required to pass, with a score of at least seventy percent, an examination administered by the department.

A nonrefundable fifty dollar assessment shall be charged to take this examination; and

(d) Pay the fee prescribed in WAC 296-65-025.

(3) Individuals shall not perform any asbestos project work prior to issuance of the certificate.

(4) Certificates shall be issued and mailed to the individual applicants and shall be valid for one year from the date of issuance.

(5) Certified asbestos workers shall attend an eight-hour worker refresher course prior to certificate renewal.

(a) The course shall, at a minimum, adequately review the subjects required by WAC 296-65-005, update information on state-of-the-art procedures and equipment, and review regulatory changes and interpretations. Specific subjects may be required by the department.

(b) An application for renewal of the certificate must be validated by the refresher training course instructor.

(c) The refresher course must be taken prior to expiration of the certificate.

(d) The certificate renewal application must be received by the department no later than the expiration date of the current certificate. Applicants missing this renewal deadline shall be required to pass, with a score of seventy percent, an examination administered by the department. A nonrefundable fifty dollar fee will be charged to take this examination.

(e) Individuals whose certificates have been expired for more than six months will be required to retake the entire basic worker course.

(6) The initial TSCA Title II worker accreditation certificate and the current worker certificate shall be available for inspection at all times at the location of the asbestos project.

(7) The department may suspend or revoke a certificate as provided in WAC 296-65-050 and chapter 296-350 WAC.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-05-056, § 296-65-010, filed 2/16/96, effective 4/1/96. Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-010, filed 10/10/89, effective 11/24/89. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-010, filed 10/22/85.]

WAC 296-65-012 Asbestos supervisor certification.

(1) For the purposes of this section, "individual" means any natural person.

(2) To qualify for an asbestos supervisor certificate, an individual must meet the following criteria:

(a) Have at least 1600 hours of experience in one or more of the following disciplines:

- (i) Asbestos abatement;
- (ii) Asbestos project design;
- (iii) Consultation on asbestos abatement projects;
- (iv) Operations and maintenance program supervision;
- (v) Construction project supervision;

(b) Successfully complete an approved asbestos supervisor training course;

(c) Achieve a score of at least seventy percent on a one hundred question multiple choice closed book examination approved by the department but administered by the training course sponsor;

(d) Submit to the department a timely application validated by an approved training course sponsor. To be considered timely, an application must be received by the department not later than sixty days after the completion of the

course. In the event that an application is not timely, the individual shall be required to pass, with a score of at least seventy percent, an examination administered by the department. A nonrefundable fifty dollar assessment shall be charged to take this examination; and

(e) Pay the fee prescribed in WAC 296-65-025.

(3) An individual shall not supervise any asbestos project prior to issuance of the certificate.

(4) Certificates shall be issued and mailed to the individual applicants and shall be valid for one year from the date of issuance.

(5) A certified asbestos supervisor shall attend an eight-hour supervisor refresher course prior to certificate renewal. It shall not be necessary to also take a worker refresher course.

(a) The course shall, at a minimum, adequately review the subjects required by WAC 296-65-007, update information on state-of-the-art procedures and equipment, and review regulatory changes and interpretations. Specific subjects may be required by the department.

(b) An application for renewal of the certificate must be validated by the refresher training course instructor.

(c) The refresher course must be taken prior to expiration of the certificate.

(d) The certificate renewal application must be received by the department no later than the expiration date of the current certificate. Applicants missing this renewal deadline shall be required to pass, with a score of seventy percent, an examination administered by the department. A nonrefundable fifty dollar fee will be charged to take this examination.

(e) Individuals whose certificates have been expired for more than six months will be required to retake the entire basic supervisor course.

(6) The initial TSCA Title II supervisor accreditation certificate and the current supervisor certificate shall be available for inspection at all times at the location of the asbestos project.

(7) The department may suspend or revoke a certificate as provided in WAC 296-65-050 and chapter 296-350 WAC.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-05-056, § 296-65-012, filed 2/16/96, effective 4/1/96. Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-012, filed 10/10/89, effective 11/24/89.]

WAC 296-65-015 Training course approval. (1) Basic and refresher asbestos training courses may be sponsored by any individual, person, or other entity having department approval. Approval shall be contingent on the sponsor's compliance, as applicable, with licensing requirements established by the state board of vocational education.

(2) Prior to receiving department approval, each course shall be evaluated by the department for the breadth of knowledge and experience required to properly train asbestos workers or supervisors. Course content shall be carefully scrutinized for adequacy and accuracy. Training techniques will be evaluated by the department.

(3) Sponsors of basic and refresher training courses proposed for approval must submit:

- (a) Background information about course sponsors;
- (b) Course locations and fees;
- (c) Copies of course handouts;

(d) A detailed description of course content and the amount of time allotted to each major topic;

(e) A description of teaching methods to be utilized and a list of all audio-visual materials; the department may, in its discretion, request that copies of the materials be provided for review. Any audio-visual materials provided to the department will be returned to the applicant;

(f) A list of all personnel involved in course preparation and presentation and a description of the background, special training and qualifications of each. Instructors shall have academic and/or field experience in asbestos abatement. The department may, in its discretion, require proposed instructors to pass an examination on subjects related to their respective topics of instruction;

(g) A description of student evaluation methods and a copy of the required written examination including the scoring methodology to be used in grading the examination;

(h) A description of course evaluation methods;

(i) Any restrictions on attendance (language, class size, affiliation, etc.);

(j) A list of any other states that currently approve the training course;

(k) A letter from the course provider that clearly indicates how the course provider meets the EPA MAP requirements; and

(l) The amount and type of hands-on training for initial training courses.

(4) Application for training course approval and course materials shall be submitted to the department at least sixty days prior to the requested approval date. Materials may be mailed to:

Asbestos Certification Program
Department of Labor and
Industries
P.O. Box 44614
Olympia, Washington 98504-4614

(5) The decision to grant or renew approval of a basic or refresher asbestos training course shall be in the sole discretion of the department.

Following approval of a basic or refresher asbestos training course, the department will issue the course sponsor an approval which is valid for one year from the date of issuance. Application for renewal must follow the procedures described in subsections (3) and (4) of this section.

Following approval of a basic or refresher asbestos training course, in recognition that asbestos abatement is an evolving industry, the department reserves the right to require additional subjects to be taught and to specify the amount of time which shall be allotted to adequately cover required subjects. To assure adequate coverage of required material, each sponsor shall be provided and required to incorporate into their training course, a detailed outline of subject matter developed by the department.

(6) To be considered timely, the training course approval renewal must be received by the department no later than thirty days before the certificate expiration date.

(7) Any changes to a training course must be approved by the department in advance.

(8) The course sponsor shall provide the department with a list of all persons who have completed a basic or refresher training course. The list must be provided no later than ten days after a course is completed and must include the name and address of each trainee.

(9) The course sponsor must notify the department, in writing, at least fourteen days before a training course is scheduled to begin. The notification must include the date, time and address where the training will be conducted.

(10) A representative of the department may, at the department's discretion, attend a training course as an observer to verify that the training course is conducted in accordance with the program approved by the department.

(11) Course sponsors conducting training outside the state of Washington shall reimburse the department for reasonable travel expenses associated with department audits of the training courses. Reasonable travel expenses are defined as current state of Washington per diem and travel allowance rates including airfare and/or surface transportation rates. Such reimbursement shall be paid within thirty days of receipt of the billing notice.

(12) The training course sponsor shall limit each class to a maximum of thirty participants.

(13) The instructor to student ratio shall not exceed one-to-ten for any of the training required by WAC 296-65-005(13) and 296-65-007(14).

(14) The department may terminate the training course approval, if in the department's judgment the sponsor fails to maintain the course content and quality as initially approved, or fails to make changes to a course as required by WAC 296-65-015(5). The minimum criteria for withdrawal of training course approval shall include:

(a) Misrepresentation of the extent of training courses approval by a state or EPA;

(b) Failure to submit required information or notification in a timely manner;

(c) Failure to maintain requisite records;

(d) Falsification of accreditation records, instructor qualifications, or other accreditation information; or

(e) Failure to adhere to the training standards and accreditation requirements of chapter 296-65 WAC.

(15) Any "notice of termination of training course approval" issued by the department may act as an order of immediate restraint as described by RCW 49.17.130.

(16) Recordkeeping requirements for training providers: All approved providers of accredited asbestos training courses must comply with the following minimum recordkeeping requirements:

(a) Training course materials. A training provider must retain copies of all instructional materials used in delivery of the classroom training such as student manuals, instructor notebooks and handouts.

(b) Instructor qualifications. A training provider must retain copies of all instructors' resumes, and the documents approving each instructor issued by either EPA or the department. Instructors must be approved by the department before teaching courses for accreditation purposes. A training provider must notify the department in advance whenever it changes course instructors. Records must accurately identify

the instructors that taught each particular course for each date that a course is offered.

(c) Examinations. A training provider must document that each person who receives an accreditation certificate for an initial training course has achieved a passing score on the examination. These records must clearly indicate the date upon which the exam was administered, the training course and discipline for which the exam was given, the name of the person who proctored the exam, a copy of the exam, and the name and test score of each person taking the exam. The topic and dates of the training course must correspond to those listed on that person's accreditation certificate.

(d) Accreditation certificates. The training providers shall maintain records that document the names of all persons who have been awarded certificates, their certificate numbers, the disciplines for which accreditation was conferred, training and expiration dates, and the training location. The training provider shall maintain the records in a manner that allows verification by telephone of the required information.

(e) Verification of certificate information. Training providers of refresher training courses shall confirm that their students possess valid accreditation before granting course admission.

(f) Records retention and access.

(i) The training provider shall maintain all required records for a minimum of three years. The training provider, however, may find it advantageous to retain these records for a longer period of time.

(ii) The training provider must allow reasonable access to all of the records required by the MAP, and to any other records which may be required by the department for the approval of asbestos training providers or the accreditation of asbestos training courses, to both EPA and to the department, on request.

(iii) If a training provider ceases to conduct training, the training provider shall notify the department and give it the opportunity to take possession of that provider's asbestos training records.

(17) A representative of the department may, at the department's discretion, provide an examination as a substitution to the examination administered by the training course provider. The examination replacement will be used to verify that the training course is conducted in accordance with the program approved by the department.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 97-01-079, § 296-65-015, filed 12/17/96, effective 3/1/97; 96-05-056, § 296-65-015, filed 2/16/96, effective 4/1/96. Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-015, filed 10/10/89, effective 11/24/89; 87-24-051 (Order 87-24), § 296-65-015, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-65-015, filed 4/27/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-015, filed 10/22/85.]

WAC 296-65-017 Contractor certification. (1) In order to obtain certification, an asbestos contractor must submit an application to the department. The application shall provide the following information:

(a) A list of asbestos projects conducted by the contractor during the previous twelve months. Such list shall include for each project:

- (i) Project name;
- (ii) Location;

(iii) Brief description;

(iv) Identity of any citations or enforcement actions issued for violations of asbestos regulations by any local, state, or federal jurisdiction relative to each individual project; and

(v) Name of the on-site project manager or supervisor.

(b) A list of asbestos supervisors (include certification number) working for the company.

(c) A statement certifying that the contractor has read and understands all applicable Washington state rules and regulations regarding asbestos abatement and will comply with them.

(d) A statement certifying that the applicant contractor's asbestos license or accreditation issued by any other state or jurisdiction has not been revoked, suspended, or denied by that state or jurisdiction.

(2) Upon approval, the department will issue the contractor a certificate. Denial of approval shall be in writing.

(3) Certificates shall be valid for a period of twelve months. Certificates may be extended during department review of a renewal application.

Note: In circumstances where it is necessary to coordinate an expiration date with the date of expiration of a contractor registration issued under chapter 18.27 RCW, certificates may be valid for less than one year. In such circumstances, the certificate fee prescribed in WAC 296-65-025 shall be prorated accordingly for the initial application only.

(4) The application for certificate renewal shall contain the information specified in subsection (1) of this section.

(5) Applications for renewal must be received by the department not less than sixty days before the certificate expires.

(6) The department may suspend or revoke the certificate as provided in WAC 296-65-050 and chapter 296-350 WAC.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-017, filed 10/10/89, effective 11/24/89.]

WAC 296-65-020 Notification requirements. (1)

Before any person or individual begins an asbestos project involving more than forty-eight square feet or ten linear feet, unless the surface area of the pipe is greater than forty-eight square feet, of asbestos containing material, written notification shall be provided to the department. Notices shall include:

(a) Name and address of the owner and contractor.

(b) Description of the facility including size, age, and prior use of the facility.

(c) Amount of asbestos-containing material to be removed or encapsulated.

(d) Location of the facility.

(e) Exact starting and completion dates of the asbestos project, including shifts during which abatement work will be accomplished. These dates must correspond to the dates specified in the contract. Any change in these dates or work shifts shall be communicated to the department by an amended notice.

(f) Nature of the project and methods used to remove or encapsulate the material.

(2) Notices must be received by the department no later than ten days prior to the start of the project. Notices shall be

sent directly to the department of labor and industries regional office having jurisdiction on the project.

(3) The director may waive the prenotification requirement upon written request of an owner for large-scale, on-going projects. In granting such a waiver, the director shall require the owner to provide prenotification if significant changes in personnel, methodologies, equipment, work site, or work procedures occur or are likely to occur. The director shall further require annual resubmittal of such notification.

(4) The director, upon review of an owner's reports, work practices, or other data available as a result of inspections, audits, or other authorized activities, may reduce the size threshold for prenotification required by this section. Such a change shall be based on the director's determination that significant problems in personnel, methodologies, equipment, work site, or work procedures are creating the potential for violations of this chapter.

(5) Emergency projects which disturb or release asbestos into the air shall be reported to the department within three working days after commencement of the project in the manner otherwise required under this chapter. The employees' collective bargaining representative or employee representative, if any, and other persons at the project area shall be notified of the emergency as soon as possible by the person undertaking the emergency project. A notice describing the nature of the emergency project shall be clearly posted adjacent to the work area.

(6) Incremental phasing in the conduct or design of asbestos projects or otherwise conducting or designing asbestos projects of a size less than the threshold exemption specified in subsection (1) of this section, with the intent of avoiding the notification requirements, is a violation of this chapter.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-05-056, § 296-65-020, filed 2/16/96, effective 4/1/96. Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-020, filed 10/10/89, effective 11/24/89; 87-24-051 (Order 87-24), § 296-65-020, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-65-020, filed 4/27/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-020, filed 10/22/85.]

WAC 296-65-025 Fees. (1) A nonrefundable administrative fee of twenty-five dollars shall be assessed for each initial or renewal asbestos worker certificate application. The fee (check or money order) must accompany the certificate application and be made payable to the department. An application form may be obtained from any approved training course instructor or directly from the department.

(2) A nonrefundable administrative fee of thirty-five dollars shall be assessed for each initial or renewal asbestos supervisor certificate application. The fee (check or money order) must accompany the certificate application and be made payable to the department. An application form may be obtained from any approved training course instructor or directly from the department.

(3) A nonrefundable administrative fee of one thousand dollars shall be assessed for each initial or renewal contractor certificate application. The fee (check or money order) must accompany the certificate application and be made payable to the department. An application form may be obtained from the department.

(1999 Ed.)

Note: In circumstances where it is necessary to coordinate an expiration date with the date of expiration of a contractor registration issued under chapter 18.27 RCW, certificates may be valid for less than one year. In such circumstances, the certificate fee prescribed in WAC 296-65-025 shall be prorated accordingly for the initial application only.

(4) A nonrefundable administrative fee of one thousand dollars shall be assessed for each initial and renewal application for training course approval. A check or money order shall accompany any application made under the provisions of WAC 296-65-015.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-025, filed 10/10/89, effective 11/24/89; 87-24-051 (Order 87-24), § 296-65-025, filed 11/30/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-025, filed 10/22/85.]

WAC 296-65-030 Methods of compliance. (1) Before submitting a bid or working on an asbestos abatement project, any person or individual shall obtain an asbestos contractor certificate as provided in WAC 296-65-017 and shall have in its employ at least one certified asbestos supervisor responsible for supervising all asbestos projects undertaken by the contractor.

(2) A certified asbestos supervisor will not be required on asbestos projects involving less than three square feet or three feet of asbestos-containing material unless the surface area of the pipe is greater than three square feet. A certified asbestos supervisor is required for all Class I and II asbestos work in accordance with WAC 296-62-07728 (4)(a).

(3) No employee or other individual is eligible to do work or supervise an asbestos project without being issued a certificate by the department.

(a) Employees performing Class I or Class II asbestos work shall be certified asbestos workers except when excluded in WAC 296-62-07722 (3)(b).

(b) Employees performing Class III or Class IV asbestos work as an asbestos project shall be certified asbestos workers.

Note: Exceptions to certification of asbestos work not considered to be an asbestos project are found in WAC 296-65-003 in the definition of "asbestos project," and in WAC 296-62-07722. If intact asbestos-containing materials or PACM are removed according to the required work practices, controls, respiratory protection, training and related provisions of WAC 296-62-077, certification is not required as specified in the exceptions. If asbestos-containing material or PACM is not intact, or becomes nonintact during removal, the asbestos work is considered as an asbestos project and the certification requirements of chapter 296-65 WAC apply.

(4) No person may assign any employee, contract with, or permit any individual, to remove or encapsulate asbestos in any facility without the project being performed by a certified asbestos worker and under the direct, on-site supervision of a certified asbestos supervisor.

(5) In cases in which an employer conducts an asbestos abatement project in its own facility by its own employees, supervision can be performed in the regular course of a certified asbestos supervisor's duties. Asbestos workers must have access to certified asbestos supervisors throughout the duration of the project.

(6) Any construction, renovation, remodeling, maintenance, repair, or demolition which was started without meeting the requirements of this section shall be halted immedi-

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ately and cannot be resumed before meeting such requirements.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 97-19-014, § 296-65-030, filed 9/5/97, effective 11/5/97; 96-05-056, § 296-65-030, filed 2/16/96, effective 4/1/96. Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-030, filed 10/10/89, effective 11/24/89. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-65-030, filed 4/27/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-030, filed 10/22/85.]

WAC 296-65-035 Reciprocity. (1) The department may recognize certifications issued by another state for asbestos workers or supervisors provided that:

(a) The worker is in possession of a currently valid certification from the other state; and

(b) The department evaluates the other state's qualification procedures and determines the certification to be equivalent to the minimum requirements of this chapter.

(2) When the department's evaluation of another state's qualification procedures identifies that equivalent requirements are met, the department is authorized to issue a Washington state certification upon receipt of a completed application.

(3) When the department's evaluation of another state's qualification procedures identifies deficiencies, the department may require specific supplemental training and/or examination before issuing a Washington state certification.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-035, filed 10/10/89, effective 11/24/89.]

WAC 296-65-050 Denial, suspension, and revocation of certificates. (1) The department may deny, suspend, or revoke a certificate for failure of the holder to comply with any requirement of this chapter or any applicable health and safety standards and regulations.

(2) The criteria for decertification for asbestos workers, supervisors, and contractors shall include:

(a) Performing work requiring accreditation at a job site without being in physical possession of initial and current accreditation certificates;

(b) Permitting the duplication or use of one's own accreditation certificate by another;

(c) Performing work for which accreditation has not been received; or

(d) Obtaining accreditation from a training provider that does not have approval to offer training for the particular discipline from either EPA or from a state that has a contractor accreditation plan at least as stringent as the EPA MAP.

(3) The following persons are not certified for the purposes of this chapter and their respective certificate(s) shall be revoked by the department:

(a) Any person who obtains accreditation through fraudulent representation of training or examination documents;

(b) Any person who obtains training documentation through fraudulent means;

(c) Any person who gains admission to and completes refresher training through fraudulent representation of initial or previous refresher training documentation; or

(d) Any person who obtains accreditation through fraudulent representation of accreditation requirements such as education, training, professional registration, or experience.

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(4) Before any certificate may be denied, suspended, or revoked, the holder thereof shall be given written notice of the department's intention to do so, mailed by registered mail, return receipt requested, to the holder's last known address. The notice shall enumerate the allegations against such holder and shall give him or her the opportunity to request a conference before the department. At such conference, the department and the holder shall have opportunity to produce witnesses and give testimony.

(5) A denial, suspension, or revocation order may be appealed to the board of industrial insurance appeals within fifteen working days after the denial, suspension, or revocation order is entered. The notice of appeal may be filed with the department or the board of industrial insurance appeals. The board of industrial insurance appeals shall hold the hearing in accordance with procedures established in RCW 49.17.140. Any party aggrieved by an order of the board of industrial insurance appeals may obtain superior court review in the manner provided in RCW 49.17.150.

(6) The department may suspend or revoke any certificate issued under this chapter for a period of not less than six months upon the following grounds:

(a) The certificate was obtained through error or fraud; or

(b) The holder thereof is judged to be incompetent to carry out the work for which the certificate was issued.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-05-056, § 296-65-050, filed 2/16/96, effective 4/1/96. Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-65-050, filed 10/10/89, effective 11/24/89.]

Chapter 296-67 WAC

SAFETY STANDARDS FOR PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS

WAC

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WAC 296-67-001 Process safety management of highly hazardous chemicals. (1) Purpose. This section contains requirements for preventing or minimizing the consequences of catastrophic releases of toxic, reactive, flamma-

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ble, or explosive chemicals. These releases may result in toxic, fire, or explosion hazards.

(2) Application.

(a) This part applies to the following:

(i) A process which involves a chemical at or above the specified threshold quantities listed in WAC 296-67-285, Appendix A;

(ii) A process which involves a flammable liquid or gas (as defined in WAC 296-62-05405) on site in one location, in a quantity of 10,000 pounds (4535.9 kg) or more except for:

(A) Hydrocarbon fuels used solely for workplace consumption as a fuel (e.g., propane used for comfort heating, gasoline for vehicle refueling), if such fuels are not a part of a process containing another highly hazardous chemical covered by this standard;

(B) Flammable liquids stored in atmospheric tanks or transferred which are kept below their normal boiling point without benefit of chilling or refrigeration.

(b) This part does not apply to:

(i) Retail facilities;

(ii) Oil or gas well drilling or servicing operations; or

(iii) Normally unoccupied remote facilities.

[Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-67-001, filed 8/10/92, effective 9/10/92.]

WAC 296-67-005 Definitions. "Atmospheric tank" means a storage tank which has been designed to operate at pressures from atmospheric through 0.5 p.s.i.g. (pounds per square inch gauge, 3.45 Kpa).

"Boiling point" means the boiling point of a liquid at a pressure of 14.7 pounds per square inch absolute (p.s.i.a.) (760 mm.). For the purposes of this part, where an accurate boiling point is unavailable for the material in question, or for mixtures which do not have a constant boiling point, the 10 percent point of a distillation performed in accordance with the Standard Method of Test for Distillation of Petroleum Products, ASTM D-86-62, may be used as the boiling point of the liquid.

"Catastrophic release" means a major uncontrolled emission, fire, or explosion, involving one or more highly hazardous chemicals, that presents serious danger to employees in the workplace.

"Facility" means the buildings, containers, or equipment which contain a process.

"Highly hazardous chemical" means a substance possessing toxic, reactive, flammable, or explosive properties and specified by WAC 296-67-001 (2)(a).

"Hot work" means work involving electric or gas welding, cutting, brazing, or similar flame or spark-producing operations.

"Normally unoccupied remote facility" means a facility which is operated, maintained, or serviced by employees who visit the facility only periodically to check its operation and to perform necessary operating or maintenance tasks. No employees are permanently stationed at the facility. Facilities meeting this definition are not contiguous with, and must be geographically remote from all other buildings, processes, or persons.

"Process" means any activity involving a highly hazardous chemical including any use, storage, manufacturing, han-

dling, or the on-site movement of such chemicals, or combination of these activities. For purposes of this definition, any group of vessels which are interconnected and separate vessels which are located such that a highly hazardous chemical could be involved in a potential release shall be considered a single process.

"Replacement in kind" means a replacement which satisfies the design specification.

"Trade secret" means any confidential formula, pattern, process, device, information, or compilation of information that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it. Chapter 296-62 WAC, Part C, sets out the criteria to be used in evaluating trade secrets.

[Statutory Authority: Chapter 49.17 RCW. 93-21-075 (Order 93-06), § 296-67-005, filed 10/20/93, effective 12/1/93; 92-17-022 (Order 92-06), § 296-67-005, filed 8/10/92, effective 9/10/92.]

WAC 296-67-009 Employee participation. (1) Employers shall develop a written plan of action regarding the implementation of the employee participation required by this section.

(2) Employers shall consult with employees and their representatives on the conduct and development of process hazards analyses and on the development of the other elements of process safety management in this standard.

(3) Employers shall provide to employees and their representatives access to process hazard analyses and to all other information required to be developed under this standard.

[Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-67-009, filed 8/10/92, effective 9/10/92.]

WAC 296-67-013 Process safety information. In accordance with the schedule set forth in WAC 296-67-017, the employer shall complete a compilation of written process safety information before conducting any process hazard analysis required by the standard. The compilation of written process safety information is to enable the employer and the employees involved in operating the process to identify and understand the hazards posed by those processes involving highly hazardous chemicals. This process safety information shall include information pertaining to the hazards of the highly hazardous chemicals used or produced by the process, information pertaining to the technology of the process, and information pertaining to the equipment in the process.

(1) Information pertaining to the hazards of the highly hazardous chemicals in the process. This information shall consist of at least the following:

- (a) Toxicity information;
- (b) Permissible exposure limits;
- (c) Physical data;
- (d) Reactivity data;
- (e) Corrosivity data;
- (f) Thermal and chemical stability data; and
- (g) Hazardous effects of inadvertent mixing of different materials that could foreseeably occur.

Note: Material Safety Data Sheets meeting the requirements of WAC 296-62-05413 may be used to comply with this requirement to the extent they contain the information required by this section.

(2) Information pertaining to the technology of the process.

(a) Information concerning the technology of the process shall include at least the following:

(i) A block flow diagram or simplified process flow diagram (see WAC 296-67-289, Appendix B);

(ii) Process chemistry;

(iii) Maximum intended inventory;

(iv) Safe upper and lower limits for such items as temperatures, pressures, flows, or compositions; and

(v) An evaluation of the consequences of deviations, including those affecting the safety and health of employees.

(b) Where the original technical information no longer exists, such information may be developed in conjunction with the process hazard analysis in sufficient detail to support the analysis.

(3) Information pertaining to the equipment in the process.

(a) Information pertaining to the equipment in the process shall include:

(i) Materials of construction;

(ii) Piping and instrument diagrams (P&IDs);

(iii) Electrical classification;

(iv) Relief system design and design basis;

(v) Ventilation system design;

(vi) Design codes and standards employed;

(vii) Material and energy balances for processes built after May 26, 1992; and

(viii) Safety systems (e.g., interlocks, detection, or suppression systems).

(b) The employer shall document that equipment complies with recognized and generally accepted good engineering practices.

(c) For existing equipment designed and constructed in accordance with codes, standards, or practices that are no longer in general use, the employer shall determine and document that the equipment is designed, maintained, inspected, tested, and operating in a safe manner.

[Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-67-013, filed 8/10/92, effective 9/10/92.]

WAC 296-67-017 Process hazard analysis. (1) The employer shall perform an initial process hazard analysis (hazard evaluation) on processes covered by this standard. The process hazard analysis shall be appropriate to the complexity of the process and shall identify, evaluate, and control the hazards involved in the process. Employers shall determine and document the priority order for conducting process hazard analyses based on a rationale which includes such considerations as extent of the process hazards, number of potentially affected employees, age of the process, and operating history of the process. The process hazard analysis shall be conducted as soon as possible, but not later than the following schedule:

(a) No less than 25 percent of the initial process hazards analyses shall be completed by May 26, 1994;

(b) No less than 50 percent of the initial process hazards analyses shall be completed by May 26, 1995;

(c) No less than 75 percent of the initial process hazards analyses shall be completed by May 26, 1996;

(d) All initial process hazards analyses shall be completed by May 26, 1997;

(e) Process hazards analyses completed after May 26, 1987, which meet the requirements of this section are acceptable as initial process hazards analyses. These process hazard analyses shall be updated and revalidated, based on their completion date, in accordance with this section.

(2) The employer shall use one or more of the following methodologies that are appropriate to determine and evaluate the hazards of the process being analyzed.

(a) What-If;

(b) Checklist;

(c) What-If/Checklist;

(d) Hazard and Operability Study (HAZOP);

(e) Failure Mode and Effects Analysis (FMEA);

(f) Fault Tree Analysis; or

(g) An appropriate equivalent methodology.

(3) The process hazard analysis shall address:

(a) The hazards of the process;

(b) The identification of any previous incident which had a likely potential for catastrophic consequences in the workplace;

(c) Engineering and administrative controls applicable to the hazards and their interrelationships such as appropriate application of detection methodologies to provide early warning of releases. (Acceptable detection methods might include process monitoring and control instrumentation with alarms, and detection hardware such as hydrocarbon sensors);

(d) Consequences of failure of engineering and administrative controls;

(e) Facility siting;

(f) Human factors; and

(g) A qualitative evaluation of a range of the possible safety and health effects of failure of controls on employees in the workplace.

(4) The process hazard analysis shall be performed by a team with expertise in engineering and process operations, and the team shall include at least one employee who has experience and knowledge specific to the process being evaluated. Also, one member of the team must be knowledgeable in the specific process hazard analysis methodology being used.

(5) The employer shall establish a system to promptly address the team's findings and recommendations; assure that the recommendations are resolved in a timely manner and that the resolution is documented; document what actions are to be taken; complete actions as soon as possible; develop a written schedule of when these actions are to be completed; communicate the actions to operating, maintenance, and other employees whose work assignments are in the process and who may be affected by the recommendations or actions.

(6) At least every five years after the completion of the initial process hazard analysis, the process hazard analysis shall be updated and revalidated by a team meeting the requirements of this section, to assure that the process hazard analysis is consistent with the current process.

(7) Employers shall retain process hazards analyses and updates or revalidations for each process covered by this part,

as well as the documented resolution of recommendations described in this section for the life of the process.

[Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-67-017, filed 8/10/92, effective 9/10/92.]

WAC 296-67-021 Operating procedures. (1) The employer shall develop and implement written operating procedures that provide clear instructions for safely conducting activities involved in each covered process consistent with the process safety information and shall address at least the following elements.

(a) Steps for each operating phase:

(i) Initial startup;

(ii) Normal operations;

(iii) Temporary operations;

(iv) Emergency shutdown including the conditions under which emergency shutdown is required, and the assignment of shutdown responsibility to qualified operators to ensure that emergency shutdown is executed in a safe and timely manner;

(v) Emergency operations;

(vi) Normal shutdown; and

(vii) Startup following a turnaround, or after an emergency shutdown.

(b) Operating limits:

(i) Consequences of deviation; and

(ii) Steps required to correct or avoid deviation.

(c) Safety and health considerations:

(i) Properties of, and hazards presented by, the chemicals used in the process;

(ii) Precautions necessary to prevent exposure, including engineering controls, administrative controls, and personal protective equipment;

(iii) Control measures to be taken if physical contact or airborne exposure occurs;

(iv) Quality control for raw materials and control of hazardous chemical inventory levels; and

(v) Any special or unique hazards.

(d) Safety systems and their functions.

(2) Operating procedures shall be readily accessible to employees who work in or maintain a process.

(3) The operating procedures shall be reviewed as often as necessary to assure that they reflect current operating practice, including changes that result from changes in process chemicals, technology, and equipment, and changes to facilities.

(4) The employer shall certify annually that these operating procedures are current and accurate.

(5) The employer shall develop and implement safe work practices to provide for the control of hazards during operations such as lockout/tagout; confined space entry; opening process equipment or piping; and control over entrance into a facility by maintenance, contractor, laboratory, or other support personnel. These safe work practices shall apply to employees and contractor employees.

[Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-67-021, filed 8/10/92, effective 9/10/92.]

WAC 296-67-025 Training. (1) Initial training.

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(a) Each employee presently involved in operating a process, and each employee before being involved in operating a newly assigned process, shall be trained in an overview of the process and in the operating procedures as specified in WAC 296-67-021. The training shall include emphasis on the specific safety and health hazards, emergency operations including shutdown, and safe work practices applicable to the employee's job tasks.

(b) In lieu of initial training for those employees already involved in operating a process on May 26, 1992, an employer may certify in writing that the employee has the required knowledge, skills, and abilities to safely carry out the duties and responsibilities as specified in the operating procedures.

(2) Refresher training. Refresher training shall be provided at least every three years, and more often if necessary, to each employee involved in operating a process to assure that the employee understands and adheres to the current operating procedures of the process. The employer, in consultation with the employees involved in operating the process, shall determine the appropriate frequency of refresher training.

(3) Training documentation. The employer shall ascertain that each employee involved in operating a process has received and understood the training required by this section. The employer shall prepare a record which contains the identity of the employee, the date of training, and the means used to verify that the employee understood the training.

[Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-67-025, filed 8/10/92, effective 9/10/92.]

WAC 296-67-029 Contractors. (1) Application. This section applies to contractors performing maintenance or repair, turnaround, major renovation, or specialty work on or adjacent to a covered process. It does not apply to contractors providing incidental services which do not influence process safety, such as janitorial work, food and drink services, laundry, delivery, or other supply services.

(2) Employer responsibilities.

(a) The employer, when selecting a contractor, shall obtain and evaluate information regarding the contract employer's safety performance and programs.

(b) The employer shall inform contract employers of the known potential fire, explosion, or toxic release hazards related to the contractor's work and the process.

(c) The employer shall explain to contract employers the applicable provisions of the emergency action plan required by WAC 296-67-053.

(d) The employer shall develop and implement safe work practices consistent with WAC 296-67-021, to control the entrance, presence, and exit of contract employers and contract employees in covered process areas.

(e) The employer shall periodically evaluate the performance of contract employers in fulfilling their obligations as specified in subsection (3) of this section.

(f) The employer shall maintain a contract employee injury and illness log related to the contractor's work in process areas.

(3) Contract employer responsibilities.

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(a) The contract employer shall assure that each contract employee is trained in the work practices necessary to safely perform his/her job.

(b) The contract employer shall assure that each contract employee is instructed in the known potential fire, explosion, or toxic release hazards related to his/her job and the process, and the applicable provisions of the emergency action plan.

(c) The contract employer shall document that each contract employee has received and understood the training required by this paragraph. The contract employer shall prepare a record which contains the identity of the contract employee, the date of training, and the means used to verify that the employee understood the training.

(d) The contract employer shall assure that each contract employee follows the safety rules of the facility including the safe work practices required by WAC 296-67-021.

(e) The contract employer shall advise the employer of any unique hazards presented by the contract employer's work, or of any hazards found by the contract employer's work.

[Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-67-029, filed 8/10/92, effective 9/10/92.]

WAC 296-67-033 Prestartup safety review. (1) The employer shall perform a prestartup safety review for new facilities and for modified facilities when the modification is significant enough to require a change in the process safety information.

(2) The prestartup safety review shall confirm that prior to the introduction of highly hazardous chemicals to a process:

(a) Construction and equipment is in accordance with design specifications;

(b) Safety, operating, maintenance, and emergency procedures are in place and are adequate;

(c) For new facilities, a process hazard analysis has been performed and recommendations have been resolved or implemented before startup; and modified facilities meet the requirements contained in management of change, WAC 296-67-045.

(d) Training of each employee involved in operating a process has been completed.

[Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-67-033, filed 8/10/92, effective 9/10/92.]

WAC 296-67-037 Mechanical integrity. (1) Application. WAC 296-67-037 (2) through (6) apply to the following process equipment:

(a) Pressure vessels and storage tanks;

(b) Piping systems (including piping components such as valves);

(c) Relief and vent systems and devices;

(d) Emergency shutdown systems;

(e) Controls (including monitoring devices and sensors, alarms, and interlocks); and

(f) Pumps.

(2) Written procedures. The employer shall establish and implement written procedures to maintain the ongoing integrity of process equipment.

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(3) Training for process maintenance activities. The employer shall train each employee involved in maintaining the ongoing integrity of process equipment in an overview of that process and its hazards and in the procedures applicable to the employee's job tasks to assure that the employee can perform the job tasks in a safe manner.

(4) Inspection and testing.

(a) Inspections and tests shall be performed on process equipment.

(b) Inspection and testing procedures shall follow recognized and generally accepted good engineering practices.

(c) The frequency of inspections and tests of process equipment shall be consistent with applicable manufacturers' recommendations and good engineering practices, and more frequently if determined to be necessary by prior operating experience.

(d) The employer shall document each inspection and test that has been performed on process equipment. The documentation shall identify the date of the inspection or test, the name of the person who performed the inspection or test, the serial number or other identifier of the equipment on which the inspection or test was performed, a description of the inspection or test performed, and the results of the inspection or test.

(5) Equipment deficiencies. The employer shall correct deficiencies in equipment that are outside acceptable limits (defined by the process safety information in WAC 296-67-013) before further use or in a safe and timely manner when necessary means are taken to assure safe operation.

(6) Quality assurance.

(a) In the construction of new plants and equipment, the employer shall assure that equipment as it is fabricated is suitable for the process application for which they will be used.

(b) Appropriate checks and inspections shall be performed to assure that equipment is installed properly and consistent with design specifications and the manufacturer's instructions.

(c) The employer shall assure that maintenance materials, spare parts and equipment are suitable for the process application for which they will be used.

[Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-67-037, filed 8/10/92, effective 9/10/92.]

WAC 296-67-041 Hot work permit. (1) The employer shall issue a hot work permit for hot work operations conducted on or near a covered process.

(2) The permit shall document that the fire prevention and protection requirements in WAC 296-24-695 have been implemented prior to beginning the hot work operations; it shall indicate the date(s) authorized for hot work; and identify the object on which hot work is to be performed.

(3) The permit shall be kept on file until completion of the hot work operations.

[Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-67-041, filed 8/10/92, effective 9/10/92.]

WAC 296-67-045 Management of change. (1) The employer shall establish and implement written procedures to manage changes (except for "replacements in kind") to pro-

cess chemicals, technology, equipment, and procedures; and, changes to facilities that affect a covered process.

(2) The procedures shall assure that the following considerations are addressed prior to any change:

- (a) The technical basis for the proposed change;
- (b) Impact of change on safety and health;
- (c) Modifications to operating procedures;
- (d) Necessary time period for the change; and
- (e) Authorization requirements for the proposed change.

(3) Employees involved in operating a process and maintenance and contract employees whose job tasks will be affected by a change in the process shall be informed of, and trained in, the change prior to start-up of the process or affected part of the process.

(4) If a change covered by this section results in a change in the process safety information required by WAC 296-67-013, such information shall be updated accordingly.

(5) If a change covered by this section results in a change in the operating procedures or practices required by WAC 296-67-021, such procedures or practices shall be updated accordingly.

[Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-67-045, filed 8/10/92, effective 9/10/92.]

WAC 296-67-049 Incident investigation. (1) The employer shall investigate each incident which resulted in, or could reasonably have resulted in a catastrophic release of highly hazardous chemical in the workplace.

(2) An incident investigation shall be initiated as promptly as possible, but not later than 48 hours following the incident.

(3) An incident investigation team shall be established and consist of at least one person knowledgeable in the process involved, including a contract employee if the incident involved work of the contractor, and other persons with appropriate knowledge and experience to thoroughly investigate and analyze the incident.

(4) A report shall be prepared at the conclusion of the investigation which includes at a minimum:

- (a) Date of incident;
- (b) Date investigation began;
- (c) A description of the incident;
- (d) The factors that contributed to the incident; and
- (e) Any recommendations resulting from the investigation.

(5) The employer shall establish a system to promptly address and resolve the incident report findings and recommendations. Resolutions and corrective actions shall be documented.

(6) The report shall be reviewed with all affected personnel whose job tasks are relevant to the incident findings including contract employees where applicable.

(7) Incident investigation reports shall be retained for five years.

[Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-67-049, filed 8/10/92, effective 9/10/92.]

WAC 296-67-053 Emergency planning and response. The employer shall establish and implement an emergency action plan for the entire plant in accordance with the provisions of WAC 296-24-567. In addition, the emergency action plan shall include procedures for handling small releases. Employers covered under this standard may also be subject to the hazardous waste and emergency response provisions contained in chapter 296-62 WAC, Part P.

[Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-67-053, filed 8/10/92, effective 9/10/92.]

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WAC 296-67-057 Compliance audits. (1) Employers shall certify that they have evaluated compliance with the provisions of this section at least every three years to verify that the procedures and practices developed under the standard are adequate and are being followed.

(2) The compliance audit shall be conducted by at least one person knowledgeable in the process.

(3) A report of the findings of the audit shall be developed.

(4) The employer shall promptly determine and document an appropriate response to each of the findings of the compliance audit, and document that deficiencies have been corrected.

(5) Employers shall retain the two most recent compliance audit reports.

[Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-67-057, filed 8/10/92, effective 9/10/92.]

WAC 296-67-061 Trade secrets. (1) Employers shall make all information necessary to comply with the section available to those persons responsible for compiling the process safety information (required by WAC 296-67-013), those assisting in the development of the process hazard analysis (required by WAC 296-67-017), those responsible for developing the operating procedures (required by WAC 296-67-021), and those involved in incident investigations (required by WAC 296-67-049), emergency planning and response (WAC 296-67-053) and compliance audits (WAC 296-67-057) without regard to possible trade secret status of such information.

(2) Nothing in this section shall preclude the employer from requiring the persons to whom the information is made available under WAC 296-67-061 to enter into confidentiality agreements not to disclose the information as set forth in WAC 296-62-054.

(3) Subject to the rules and procedures set forth in WAC 296-62-05417 (1) through (14), employees and their designated representatives shall have access to trade secret information contained within the process hazard analysis and other documents required to be developed by this standard.

[Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-67-061, filed 8/10/92, effective 9/10/92.]

WAC 296-67-285 Appendix A—List of highly hazardous chemicals, toxics and reactives (mandatory). This appendix contains a listing of toxic and reactive highly hazardous chemicals which present a potential for a catastrophic event at or above the threshold quantity.

CHEMICAL NAME	CAS*	TQ**
Acetaldehyde	75-07-0	2500
Acrolein (2-Propenal)	107-02-8	150
Acrylyl Chloride	814-68-6	250
Allyl Chloride	107-05-1	1000
Allylamine	107-11-9	1000
Alkylaluminums	Varies	5000
Ammonia, Anhydrous	7664-41-7	10000
Ammonia solutions		
(>44% ammonia by weight)	7664-41-7	15000
Ammonium Perchlorate	7790-98-9	7500
Ammonium Permanganate	7787-36-2	7500
Arsine (also called Arsenic Hydride)	7784-42-1	100
Bis(Chloromethyl) Ether	542-88-1	100
Boron Trichloride	10294-34-5	2500

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CHEMICAL NAME	CAS*	TQ**	CHEMICAL NAME	CAS*	TQ**
Boron Trifluoride	7637-07-2	250	Methyl Chloride	74-87-3	15000
Bromine	7726-95-6	1500	Methyl Chloroformate	79-22-1	500
Bromine Chloride	13863-41-7	1500	Methyl Ethyl Ketone Peroxide (concentration >60%)	1338-23-4	5000
Bromine Pentafluoride	7789-30-2	2500	Methyl Fluoroacetate	453-18-9	100
Bromine Trifluoride	7787-71-5	15000	Methyl Fluorosulfate	421-20-5	100
3-Bromopropyne (also called Propargyl Bromide)	106-96-7	100	Methyl Hydrazine	60-34-4	100
Butyl Hydroperoxide (Tertiary)	75-91-2	5000	Methyl Iodide	74-88-4	7500
Butyl Perbenzoate (Tertiary)	614-45-9	7500	Methyl Isocyanate	624-83-9	250
Carbonyl Chloride (see Phosgene)	75-44-5	100	Methyl Mercaptan	74-93-1	5000
Carbonyl Fluoride	353-50-4	2500	Methyl Vinyl Ketone	79-84-4	100
Cellulose Nitrate (concentration >12.6% nitrogen)	9004-70-0	2500	Methyltrichlorosilane	75-79-6	500
Chlorine	7782-50-5	1500	Nickel Carbonyl (Nickel Tetracarbonyl)	13463-39-3	150
Chlorine Dioxide	10049-04-4	1000	Nitric Acid (94.5% by weight or greater)	7697-37-2	500
Chlorine Pentafluoride	13637-63-3	1000	Nitric Oxide	10102-43-9	250
Chlorine Trifluoride	7790-91-2	1000	Nitroaniline (para Nitroaniline)	100-01-6	5000
Chlorodiethylaluminum (also called Diethylaluminum Chloride)	96-10-6	5000	Nitromethane	75-52-5	2500
1-Chloro-2,4-Dinitrobenzene	97-00-7	5000	Nitrogen Dioxide	10102-44-0	250
Chloromethyl Methyl Ether	107-30-2	500	Nitrogen Oxides (NO; NO ₂ ; N ₂ O ₄ ; N ₂ O ₃)	10102-44-0	250
Chloropicrin	76-06-2	500	Nitrogen Tetroxide (also called Nitrogen Peroxide)	10544-72-6	250
Chloropicrin and Methyl Bromide mixture	None	1500	Nitrogen Trifluoride	7783-54-2	5000
Chloropicrin and Methyl Chloride mixture	None	1500	Nitrogen Trioxide	10544-73-7	250
Cumene Hydroperoxide	80-15-9	5000	Oleum (65% to 80% by weight; also called Fuming Sulfuric Acid)	8014-94-7	1000
Cyanogen	460-19-5	2500	Osmium Tetroxide	20816-12-0	100
Cyanogen Chloride	506-77-4	500	Oxygen Difluoride (Fluorine Monoxide)	7783-41-7	100
Cyanuric Fluoride	675-14-9	100	Ozone	10028-15-6	100
Diacetyl Peroxide (Concentration >70%)	110-22-5	5000	Pentaborane	19624-22-7	100
Diazomethane	334-88-3	500	Peracetic Acid (concentration >60% Acetic Acid; also called Peroxyacetic Acid)	79-21-0	1000
Dibenzoyl Peroxide	94-36-0	7500	Perchloric Acid (concentration >60% by weight)	7601-90-3	5000
Diborane	19287-45-7	100	Perchloromethyl Mercaptan	594-42-3	150
Dibutyl Peroxide (Tertiary)	110-05-4	5000	Perchloryl Fluoride	7616-94-6	5000
Dichloro Acetylene	7572-29-4	250	Peroxyacetic Acid (concentration >60% Acetic Acid; also called Peracetic Acid)	79-21-0	1000
Dichlorosilane	4109-96-0	2500	Phosgene (also called Carbonyl Chloride)	75-44-5	100
Diethylzinc	557-20-0	10000	Phosphine (Hydrogen Phosphide)	7803-51-2	100
Diisopropyl Peroxydicarbonate	105-64-6	7500	Phosphorus Oxychloride (also called Phosphoryl Chloride)	10025-87-3	1000
Dilaluroyl Peroxide	105-74-8	7500	Phosphorus Trichloride	7719-12-2	1000
Dimethyldichlorosilane	75-78-5	1000	Phosphoryl Chloride (also called Phosphorus Oxychloride)	10025-87-3	1000
Dimethylhydrazine, 1,1-	57-14-7	1000	Propargyl Bromide	106-96-7	100
Dimethylamine, Anhydrous	124-40-3	2500	Propyl Nitrate	627-3-4	2500
2,4-Dinitroaniline	97-02-9	5000	Sarin	107-44-8	100
Ethyl Methyl Ketone Peroxide (also Methyl Ethyl Ketone Peroxide; concentration >60%)	1338-23-4	5000	Selenium Hexafluoride	7783-79-1	1000
Ethyl Nitrite	109-95-5	5000	Stibine (Antimony Hydride)	7803-52-3	500
Ethylamine	75-04-7	7500	Sulfur Dioxide (liquid)	7446-09-5	1000
Ethylene Fluorohydrin	371-62-0	100	Sulfur Pentafluoride	5714-22-7	250
Ethylene Oxide	75-21-8	5000	Sulfur Tetrafluoride	7783-60-0	250
Ethyleneimine	151-56-4	1000	Sulfur Trioxide (also called Sulfuric Anhydride)	7446-11-9	1000
Fluorine	7782-41-4	1000	Sulfuric Anhydride (also called Sulfur Trioxide)	7446-11-9	1000
Formaldehyde (Formalin)	50-00-0	1000	Tellurium Hexafluoride	7783-80-4	250
Furan	110-00-9	500	Tetrafluoroethylene	116-14-3	5000
Hexafluoroacetone	684-16-2	5000	Tetrafluorohydrazine	10036-47-2	5000
Hydrochloric Acid, Anhydrous	7647-01-0	5000	Tetramethyl Lead	75-74-1	1000
Hydrofluoric Acid, Anhydrous	7664-39-3	1000	Thionyl Chloride	7719-09-7	250
Hydrogen Bromide	10035-10-6	5000	Trichloro (chloromethyl) Silane	1558-25-4	100
Hydrogen Chloride	7647-01-0	5000	Trichloro (dichlorophenyl) Silane	27137-85-5	2500
Hydrogen Cyanide, Anhydrous	74-90-8	1000	Trichlorosilane	10025-78-2	5000
Hydrogen Fluoride	7664-39-3	1000	Trifluorochloroethylene	79-38-9	10000
Hydrogen Peroxide (52% by weight or greater)	7722-84-1	7500	Trimethoxysilane	2487-90-3	1500
Hydrogen Selenide	7783-07-5	150			
Hydrogen Sulfide	7783-06-4	1500			
Hydroxylamine	7803-49-8	2500			
Iron, Pentacarbonyl	13463-40-6	250			
Isopropylamine	75-31-0	5000			
Ketene	463-51-4	100			
Methacrylaldehyde	78-85-3	1000			
Methacryloyl Chloride	920-46-7	150			
Methacryloyloxyethyl Isocyanate	30674-80-7	100			
Methyl Acrylonitrile	126-98-7	250			
Methylamine, Anhydrous	74-89-5	1000			
Methyl Bromide	74-83-9	2500			

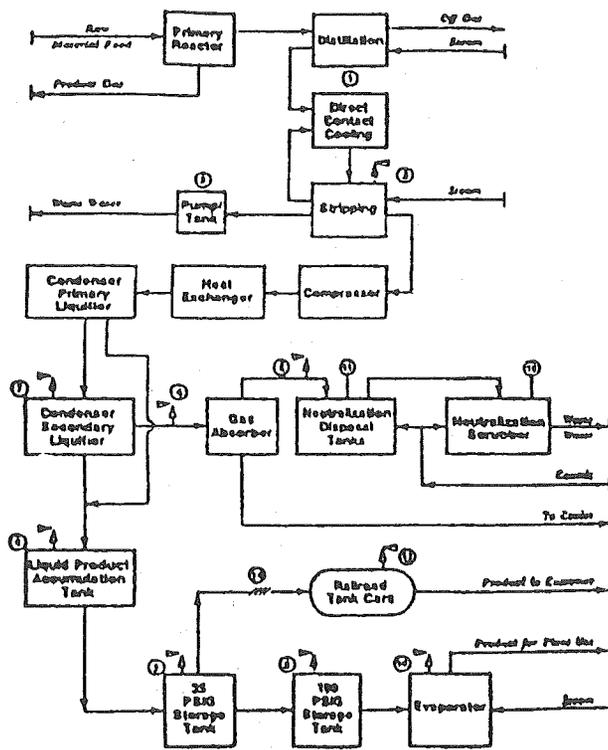
* Chemical Abstract Service Number.

** Threshold Quantity in Pounds (Amount necessary to be covered by this standard).

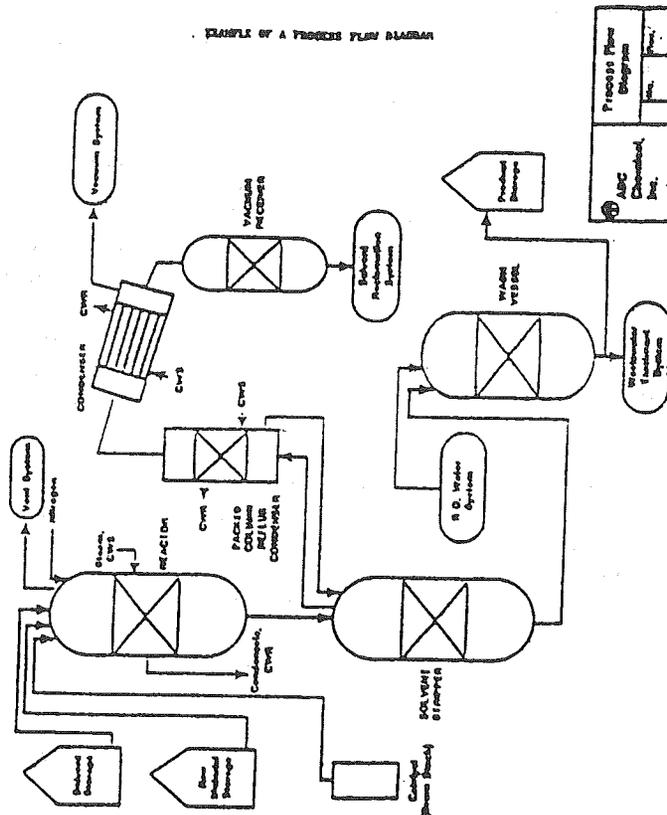
[Statutory Authority: Chapter 49.17 RCW. 93-21-075 (Order 93-06), § 296-67-285, filed 10/20/93, effective 12/1/93; 92-17-022 (Order 92-06), § 296-67-285, filed 8/10/92, effective 9/10/92.]

WAC 296-67-289 Appendix B—Block flow diagram and simplified process flow diagram (nonmandatory).

EXAMPLE OF A BLOCK FLOW DIAGRAM



EXAMPLE OF A PROCESS FLOW DIAGRAM



[Statutory Authority: Chapter 49.17 RCW, 92-17-022 (Order 92-06), § 296-67-289, filed 8/10/92, effective 9/10/92.]

WAC 296-67-291 Appendix C—Compliance guidelines and recommendations for process safety management (nonmandatory). This appendix serves as a nonmandatory guideline to assist employers and employees in complying with the requirements of this section, as well as provides other helpful recommendations and information. Examples presented in this appendix are not the only means of achieving the performance goals in the standard. This appendix neither adds nor detracts from the requirements of the standard.

(1) Introduction to process safety management. The major objective of process safety management of highly hazardous chemicals is to prevent unwanted releases of hazardous chemicals especially into locations which could expose employees and others to serious hazards. An effective process safety management program requires a systematic approach to evaluating the whole process. Using this approach the process design, process technology, operational and maintenance activities and procedures, nonroutine activities and procedures, emergency preparedness plans and procedures, training programs, and other elements which impact the process are all considered in the evaluation. The various lines of defense that have been incorporated into the design and operation of the process to prevent or mitigate the release of hazardous chemicals need to be evaluated and strengthened to assure their effectiveness at each level. Process safety management is the proactive identification, evaluation and mitigation or prevention of chemical releases that could occur as a result of failures in process, procedures, or equipment. The process safety management standard targets highly hazardous chemicals that have the potential to cause a catastrophic incident. This standard as a whole is to aid employers in their efforts to prevent or mitigate episodic chemical releases that could lead to a catastrophe in the workplace and possibly to the surrounding community. To control these types of hazards, employers need to develop the necessary expertise, experiences, judgment, and proactive initiative within their workforce to properly implement and maintain an effective process safety management program as envisioned in the WISHA standard. This WISHA standard is required by the Clean Air Act amendments as is the Environmental Protection Agency's Risk Management Plan. Employers, who merge the two sets of requirements into their process safety management program, will better assure full compliance with each as well as enhancing their relationship with the local community. While WISHA believes process safety management will have a positive effect on the safety of employees in workplaces and also offers other potential benefits to employers (increased productivity), smaller businesses which may have limited resources available to them at this time, might consider alternative avenues of decreasing the risks associated with highly hazardous chemicals at their workplaces. One method which might be considered is the reduction in the inventory of the highly hazardous chemical. This reduction in inventory will result in a reduction of the risk or potential for a catastrophic incident. Also, employers including small employers may be able to establish more efficient inventory control by reducing the quantities of highly hazardous chemicals on site below the established threshold quantities. This reduction can be accomplished by ordering

smaller shipments and maintaining the minimum inventory necessary for efficient and safe operation. When reduced inventory is not feasible, then the employer might consider dispersing inventory to several locations on site. Dispersing storage into locations where a release in one location will not cause a release in another location is a practical method to also reduce the risk or potential for catastrophic incidents.

(2) Employee involvement in process safety management. Section 304 of the Clean Air Act amendments states that employers are to consult with their employees and their representatives regarding the employers efforts in the development and implementation of the process safety management program elements and hazard assessments. Section 304 also requires employers to train and educate their employees and to inform affected employees of the findings from incident investigations required by the process safety management program. Many employers, under their safety and health programs, have already established means and methods to keep employees and their representatives informed about relevant safety and health issues and employers may be able to adapt these practices and procedures to meet their obligations under this standard. Employers who have not implemented an occupational safety and health program may wish to form a safety and health committee of employees and management representatives to help the employer meet the obligations specified by this standard. These committees can become a significant ally in helping the employer to implement and maintain an effective process safety management program for all employees.

(3) Process safety information. Complete and accurate written information concerning process chemicals, process technology, and process equipment is essential to an effective process safety management program and to a process hazards analysis. The compiled information will be a necessary resource to a variety of users including the team that will perform the process hazards analysis as required under WAC 296-67-017; those developing the training programs and the operating procedures; contractors whose employees will be working with the process; those conducting the prestartup reviews; local emergency preparedness planners; and enforcement officials. The information to be compiled about the chemicals, including process intermediates, needs to be comprehensive enough for an accurate assessment of the fire and explosion characteristics, reactivity hazards, the safety and health hazards to workers, and the corrosion and erosion effects on the process equipment and monitoring tools. Current material safety data sheet (MSDS) information can be used to help meet this requirement which must be supplemented with process chemistry information including runaway reaction and over pressure hazards if applicable. Process technology information will be a part of the process safety information package and it is expected that it will include diagrams of the type shown in WAC 296-67-289, Appendix B of this part as well as employer established criteria for maximum inventory levels for process chemicals; limits beyond which would be considered upset conditions; and a qualitative estimate of the consequences or results of deviation that could occur if operating beyond the established process limits. Employers are encouraged to use diagrams which will help users understand the process. A block flow

diagram is used to show the major process equipment and interconnecting process flow lines and show flow rates, stream composition, temperatures, and pressures when necessary for clarity. The block flow diagram is a simplified diagram. Process flow diagrams are more complex and will show all main flow streams including valves to enhance the understanding of the process, as well as pressures and temperatures on all feed and product lines within all major vessels, in and out of headers and heat exchangers, and points of pressure and temperature control. Also, materials of construction information, pump capacities and pressure heads, compressor horsepower and vessel design pressures and temperatures are shown when necessary for clarity. In addition, major components of control loops are usually shown along with key utilities on process flow diagrams. Piping and instrument diagrams (P&IDs) may be the more appropriate type of diagrams to show some of the above details and to display the information for the piping designer and engineering staff. The P&IDs are to be used to describe the relationships between equipment and instrumentation as well as other relevant information that will enhance clarity. Computer software programs which do P&IDs or other diagrams useful to the information package, may be used to help meet this requirement. The information pertaining to process equipment design must be documented. In other words, what were the codes and standards relied on to establish good engineering practice. These codes and standards are published by such organizations as the American Society of Mechanical Engineers, American Petroleum Institute, American National Standards Institute, National Fire Protection Association, American Society for Testing and Materials, National Board of Boiler and Pressure Vessel Inspectors, National Association of Corrosion Engineers, American Society of Exchange Manufacturers Association, and model building code groups. In addition, various engineering societies issue technical reports which impact process design. For example, the American Institute of Chemical Engineers has published technical reports on topics such as two phase flow for venting devices. This type of technically recognized report would constitute good engineering practice. For existing equipment designed and constructed many years ago in accordance with the codes and standards available at that time and no longer in general use today, the employer must document which codes and standards were used and that the design and construction along with the testing, inspection and operation are still suitable for the intended use. Where the process technology requires a design which departs from the applicable codes and standards, the employer must document that the design and construction is suitable for the intended purpose.

(4) Process hazard analysis. A process hazard analysis (PHA), sometimes called a process hazard evaluation, is one of the most important elements of the process safety management program. A PHA is an organized and systematic effort to identify and analyze the significance of potential hazards associated with the processing or handling of highly hazardous chemicals. A PHA provides information which will assist employers and employees in making decisions for improving safety and reducing the consequences of unwanted or unplanned releases of hazardous chemicals. A PHA is directed toward analyzing potential causes and consequences

of fires, explosions, releases of toxic or flammable chemicals and major spills of hazardous chemicals. The PHA focuses on equipment, instrumentation, utilities, human actions (routine and nonroutine), and external factors that might impact the process. These considerations assist in determining the hazards and potential failure points or failure modes in a process. The selection of a PHA methodology or technique will be influenced by many factors including the amount of existing knowledge about the process. Is it a process that has been operated for a long period of time with little or no innovation and extensive experience has been generated with its use? Or, is it a new process or one which has been changed frequently by the inclusion of innovative features? Also, the size and complexity of the process will influence the decision as to the appropriate PHA methodology to use. All PHA methodologies are subject to certain limitations. For example, the checklist methodology works well when the process is very stable and no changes are made, but it is not as effective when the process has undergone extensive change. The checklist may miss the most recent changes and consequently the changes would not be evaluated. Another limitation to be considered concerns the assumptions made by the team or analyst. The PHA is dependent on good judgment and the assumptions made during the study need to be documented and understood by the team and reviewer and kept for a future PHA. The team conducting the PHA need to understand the methodology that is going to be used. A PHA team can vary in size from two people to a number of people with varied operational and technical backgrounds. Some team members may only be a part of the team for a limited time. The team leader needs to be fully knowledgeable in the proper implementation of the PHA methodology that is to be used and should be impartial in the evaluation. The other full or part time team members need to provide the team with expertise in areas such as process technology, process design, operating procedures and practices, including how the work is actually performed, alarms, emergency procedures, instrumentation, maintenance procedures, both routine and non-routine tasks, including how the tasks are authorized, procurement of parts and supplies, safety and health, and any other relevant subject as the need dictates. At least one team member must be familiar with the process. The ideal team will have an intimate knowledge of the standards, codes, specifications and regulations applicable to the process being studied. The selected team members need to be compatible and the team leader needs to be able to manage the team, and the PHA study. The team needs to be able to work together while benefiting from the expertise of others on the team or outside the team, to resolve issues, and to forge a consensus on the findings of the study and recommendations. The application of a PHA to a process may involve the use of different methodologies for various parts of the process. For example, a process involving a series of unit operations of varying sizes, complexities, and ages may use different methodologies and team members for each operation. Then the conclusions can be integrated into one final study and evaluation. A more specific example is the use of a checklist PHA for a standard boiler or heat exchanger and the use of a hazard and operability PHA for the overall process. Also, for batch type processes like custom batch operations, a generic PHA of a

representative batch may be used where there are only small changes of monomer or other ingredient ratios and the chemistry is documented for the full range and ratio of batch ingredients. Another process that might consider using a generic type of PHA is a gas plant. Often these plants are simply moved from site to site and therefore, a generic PHA may be used for these movable plants. Also, when an employer has several similar size gas plants and no sour gas is being processed at the site, then a generic PHA is feasible as long as the variations of the individual sites are accounted for in the PHA. Finally, when an employer has a large continuous process which has several control rooms for different portions of the process such as for a distillation tower and a blending operation, the employer may wish to do each segment separately and then integrate the final results. Additionally, small businesses which are covered by this rule, will often have processes that have less storage volume, less capacity, and less complicated than processes at a large facility. Therefore, WISHA would anticipate that the less complex methodologies would be used to meet the process hazard analysis criteria in the standard. These process hazard analyses can be done in less time and with a few people being involved. A less complex process generally means that less data, P&IDs, and process information is needed to perform a process hazard analysis. Many small businesses have processes that are not unique, such as cold storage lockers or water treatment facilities. Where employer associations have a number of members with such facilities, a generic PHA, evolved from a checklist or what-if questions, could be developed and used by each employer effectively to reflect his/her particular process; this would simplify compliance for them. When the employer has a number of processes which require a PHA, the employer must set up a priority system of which PHAs to conduct first. A preliminary or gross hazard analysis may be useful in prioritizing the processes that the employer has determined are subject to coverage by the process safety management standard. Consideration should first be given to those processes with the potential of adversely affecting the largest number of employees. This prioritizing should consider the potential severity of a chemical release, the number of potentially affected employees, the operating history of the process such as the frequency of chemical releases, the age of the process and any other relevant factors. These factors would suggest a ranking order and would suggest either using a weighing factor system or a systematic ranking method. The use of a preliminary hazard analysis would assist an employer in determining which process should be of the highest priority and thereby the employer would obtain the greatest improvement in safety at the facility. Detailed guidance on the content and application of process hazard analysis methodologies is available from the American Institute of Chemical Engineers' Center for Chemical Process Safety (see WAC 296-67-293, Appendix D).

(5) Operating procedures and practices. Operating procedures describe tasks to be performed, data to be recorded, operating conditions to be maintained, samples to be collected, and safety and health precautions to be taken. The procedures need to be technically accurate, understandable to employees, and revised periodically to ensure that they reflect current operations. The process safety information

package is to be used as a resource to better assure that the operating procedures and practices are consistent with the known hazards of the chemicals in the process and that the operating parameters are accurate. Operating procedures should be reviewed by engineering staff and operating personnel to ensure that they are accurate and provide practical instructions on how to actually carry out job duties safely. Operating procedures will include specific instructions or details on what steps are to be taken or followed in carrying out the stated procedures. These operating instructions for each procedure should include the applicable safety precautions and should contain appropriate information on safety implications. For example, the operating procedures addressing operating parameters will contain operating instructions about pressure limits, temperature ranges, flow rates, what to do when an upset condition occurs, what alarms and instruments are pertinent if an upset condition occurs, and other subjects. Another example of using operating instructions to properly implement operating procedures is in starting up or shutting down the process. In these cases, different parameters will be required from those of normal operation. These operating instructions need to clearly indicate the distinctions between startup and normal operations such as the appropriate allowances for heating up a unit to reach the normal operating parameters. Also the operating instructions need to describe the proper method for increasing the temperature of the unit until the normal operating temperature parameters are achieved. Computerized process control systems add complexity to operating instructions. These operating instructions need to describe the logic of the software as well as the relationship between the equipment and the control system; otherwise, it may not be apparent to the operator. Operating procedures and instructions are important for training operating personnel. The operating procedures are often viewed as the standard operating practices (SOPs) for operations. Control room personnel and operating staff, in general, need to have a full understanding of operating procedures. If workers are not fluent in English then procedures and instructions need to be prepared in a second language understood by the workers. In addition, operating procedures need to be changed when there is a change in the process as a result of the management of change procedures. The consequences of operating procedure changes need to be fully evaluated and the information conveyed to the personnel. For example, mechanical changes to the process made by the maintenance department (like changing a valve from steel to brass or other subtle changes) need to be evaluated to determine if operating procedures and practices also need to be changed. All management of change actions must be coordinated and integrated with current operating procedures and operating personnel must be oriented to the changes in procedures before the change is made. When the process is shut down in order to make a change, then the operating procedures must be updated before startup of the process. Training in how to handle upset conditions must be accomplished as well as what operating personnel are to do in emergencies such as when a pump seal fails or a pipeline ruptures. Communication between operating personnel and workers performing work within the process area, such as nonroutine tasks, also must be maintained. The hazards of the tasks are to be conveyed to

operating personnel in accordance with established procedures and to those performing the actual tasks. When the work is completed, operating personnel should be informed to provide closure on the job.

(6) Employee training. All employees, including maintenance and contractor employees, involved with highly hazardous chemicals need to fully understand the safety and health hazards of the chemicals and processes they work with for the protection of themselves, their fellow employees and the citizens of nearby communities. Training conducted in compliance with WAC 296-62-054, the hazard communication standard, will help employees to be more knowledgeable about the chemicals they work with as well as familiarize them with reading and understanding MSDS. However, additional training in subjects such as operating procedures and safety work practices, emergency evacuation and response, safety procedures, routine and nonroutine work authorization activities, and other areas pertinent to process safety and health will need to be covered by an employer's training program. In establishing their training programs, employers must clearly define the employees to be trained and what subjects are to be covered in their training. Employers in setting up their training program will need to clearly establish the goals and objectives they wish to achieve with the training that they provide to their employees. The learning goals or objectives should be written in clear measurable terms before the training begins. These goals and objectives need to be tailored to each of the specific training modules or segments. Employers should describe the important actions and conditions under which the employee will demonstrate competence or knowledge as well as what is acceptable performance. Hands-on-training where employees are able to use their senses beyond listening, will enhance learning. For example, operating personnel, who will work in a control room or at control panels, would benefit by being trained at a simulated control panel or panels. Upset conditions of various types could be displayed on the simulator, and then the employee could go through the proper operating procedures to bring the simulator panel back to the normal operating parameters. A training environment could be created to help the trainee feel the full reality of the situation but, of course, under controlled conditions. This realistic type of training can be very effective in teaching employees correct procedures while allowing them to also see the consequences of what might happen if they do not follow established operating procedures. Other training techniques using videos or on-the-job training can also be very effective for teaching other job tasks, duties, or other important information. An effective training program will allow the employee to fully participate in the training process and to practice their skill or knowledge. Employers need to periodically evaluate their training programs to see if the necessary skills, knowledge, and routines are being properly understood and implemented by their trained employees. The means or methods for evaluating the training should be developed along with the training program goals and objectives. Training program evaluation will help employers to determine the amount of training their employees understood, and whether the desired results were obtained. If, after the evaluation, it appears that the trained employees are not at the level of knowledge and skill that was

expected, the employer will need to revise the training program, provide retraining, or provide more frequent refresher training sessions until the deficiency is resolved. Those who conducted the training and those who received the training should also be consulted as to how best to improve the training process. If there is a language barrier, the language known to the trainees should be used to reinforce the training messages and information. Careful consideration must be given to assure that employees including maintenance and contract employees receive current and updated training. For example, if changes are made to a process, impacted employees must be trained in the changes and understand the effects of the changes on their job tasks (e.g., any new operating procedures pertinent to their tasks). Additionally, as already discussed the evaluation of the employee's absorption of training will certainly influence the need for training.

(7) Contractors. Employers who use contractors to perform work in and around processes that involve highly hazardous chemicals, will need to establish a screening process so that they hire and use contractors who accomplish the desired job tasks without compromising the safety and health of employees at a facility. For contractors, whose safety performance on the job is not known to the hiring employer, the employer will need to obtain information on injury and illness rates and experience and should obtain contractor references. Additionally, the employer must assure that the contractor has the appropriate job skills, knowledge and certifications (such as for pressure vessel welders). Contractor work methods and experiences should be evaluated. For example, does the contractor conducting demolition work swing loads over operating processes or does the contractor avoid such hazards? Maintaining a site injury and illness log for contractors is another method employers must use to track and maintain current knowledge of work activities involving contract employees working on or adjacent to covered processes. Injury and illness logs of both the employer's employees and contract employees allow an employer to have full knowledge of process injury and illness experience. This log will also contain information which will be of use to those auditing process safety management compliance and those involved in incident investigations. Contract employees must perform their work safely. Considering that contractors often perform very specialized and potentially hazardous tasks such as confined space entry activities and nonroutine repair activities it is quite important that their activities be controlled while they are working on or near a covered process. A permit system or work authorization system for these activities would also be helpful to all affected employers. The use of a work authorization system keeps an employer informed of contract employee activities, and as a benefit the employer will have better coordination and more management control over the work being performed in the process area. A well run and well maintained process where employee safety is fully recognized will benefit all of those who work in the facility whether they be contract employees or employees of the owner.

(8) Prestartup safety. For new processes, the employer will find a PHA helpful in improving the design and construction of the process from a reliability and quality point of view. The safe operation of the new process will be enhanced

by making use of the PHA recommendations before final installations are completed. P&IDs are to be completed along with having the operating procedures in place and the operating staff trained to run the process before startup. The initial startup procedures and normal operating procedures need to be fully evaluated as part of the prestartup review to assure a safe transfer into the normal operating mode for meeting the process parameters. For existing processes that have been shutdown for turnaround, or modification, etc., the employer must assure that any changes other than "replacement in kind" made to the process during shutdown go through the management of change procedures. P&IDs will need to be updated as necessary, as well as operating procedures and instructions. If the changes made to the process during shutdown are significant and impact the training program, then operating personnel as well as employees engaged in routine and nonroutine work in the process area may need some refresher or additional training in light of the changes. Any incident investigation recommendations, compliance audits or PHA recommendations need to be reviewed as well to see what impacts they may have on the process before beginning the startup.

(9) Mechanical integrity. Employers will need to review their maintenance programs and schedules to see if there are areas where "breakdown" maintenance is used rather than an ongoing mechanical integrity program. Equipment used to process, store, or handle highly hazardous chemicals needs to be designed, constructed, installed, and maintained to minimize the risk of releases of such chemicals. This requires that a mechanical integrity program be in place to assure the continued integrity of process equipment. Elements of a mechanical integrity program include the identification and categorization of equipment and instrumentation, inspections and tests, testing and inspection frequencies, development of maintenance procedures, training of maintenance personnel, the establishment of criteria for acceptable test results, documentation of test and inspection results, and documentation of manufacturer recommendations as to meantime to failure for equipment and instrumentation. The first line of defense an employer has available is to operate and maintain the process as designed, and to keep the chemicals contained. This line of defense is backed up by the next line of defense which is the controlled release of chemicals through venting to scrubbers or flares, or to surge or overflow tanks which are designed to receive such chemicals, etc. These lines of defense are the primary lines of defense or means to prevent unwanted releases. The secondary lines of defense would include fixed fire protection systems like sprinklers, water spray, or deluge systems, monitor guns, etc., dikes, designed drainage systems, and other systems which would control or mitigate hazardous chemicals once an unwanted release occurs. These primary and secondary lines of defense are what the mechanical integrity program needs to protect and strengthen these primary and secondary lines of defenses where appropriate. The first step of an effective mechanical integrity program is to compile and categorize a list of process equipment and instrumentation for inclusion in the program. This list would include pressure vessels, storage tanks, process piping, relief and vent systems, fire protection system components, emergency shutdown systems, and alarms and

interlocks and pumps. For the categorization of instrumentation and the listed equipment the employer would prioritize which pieces of equipment require closer scrutiny than others. Meantime to failure of various instrumentation and equipment parts would be known from the manufacturer's data or the employer's experience with the parts, which would then influence the inspection and testing frequency and associated procedures. Also, applicable codes and standards such as the National Board Inspection Code, or those from the American Society for Testing and Material, American Petroleum Institute, National Fire Protection Association, American National Standards Institute, American Society of Mechanical Engineers, and other groups, provide information to help establish an effective testing and inspection frequency, as well as appropriate methodologies. The applicable codes and standards provide criteria for external inspections for such items as foundation and supports, anchor bolts, concrete or steel supports, guy wires, nozzles and sprinklers, pipe hangers, grounding connections, protective coatings and insulation, and external metal surfaces of piping and vessels, etc. These codes and standards also provide information on methodologies for internal inspection, and a frequency formula based on the corrosion rate of the materials of construction. Also, erosion both internal and external needs to be considered along with corrosion effects for piping and valves. Where the corrosion rate is not known, a maximum inspection frequency is recommended, and methods of developing the corrosion rate are available in the codes. Internal inspections need to cover items such as vessel shell, bottom and head; metallic linings; nonmetallic linings; thickness measurements for vessels and piping; inspection for erosion, corrosion, cracking and bulges; internal equipment like trays, baffles, sensors, and screens for erosion, corrosion or cracking and other deficiencies. Some of these inspections may be performed by state or local government inspectors under state and local statutes. However, each employer needs to develop procedures to ensure that tests and inspections are conducted properly and that consistency is maintained even where different employees may be involved. Appropriate training is to be provided to maintenance personnel to ensure that they understand the preventive maintenance program procedures, safe practices, and the proper use and application of special equipment or unique tools that may be required. This training is part of the overall training program called for in the standard. A quality assurance system is needed to help ensure that the proper materials of construction are used, that fabrication and inspection procedures are proper, and that installation procedures recognize field installation concerns. The quality assurance program is an essential part of the mechanical integrity program and will help to maintain the primary and secondary lines of defense that have been designed into the process to prevent unwanted chemical releases or those which control or mitigate a release. "As built" drawings, together with certifications of coded vessels and other equipment, and materials of construction need to be verified and retained in the quality assurance documentation. Equipment installation jobs need to be properly inspected in the field for use of proper materials and procedures and to assure that qualified craftsmen are used to do the job. The use of appropriate gaskets, packing, bolts, valves, lubricants, and welding

rods need to be verified in the field. Also procedures for installation of safety devices need to be verified, such as the torque on the bolts on ruptured disc installations, uniform torque on flange bolts, proper installation of pump seals, etc. If the quality of parts is a problem, it may be appropriate to conduct audits of the equipment supplier's facilities to better assure proper purchases of required equipment which is suitable for its intended service. Any changes in equipment that may become necessary will need to go through the management of change procedures.

(10) Nonroutine work authorizations. Nonroutine work which is conducted in process areas needs to be controlled by the employer in a consistent manner. The hazards identified involving the work that is to be accomplished must be communicated to those doing the work, but also to those operating personnel whose work could affect the safety of the process. A work authorization notice or permit must have a procedure that describes the steps the maintenance supervisor, contractor representative or other person needs to follow to obtain the necessary clearance to get the job started. The work authorization procedures need to reference and coordinate, as applicable, lockout/tagout procedures, line breaking procedures, confined space entry procedures and hot work authorizations. This procedure also needs to provide clear steps to follow once the job is completed in order to provide closure for those that need to know the job is now completed and equipment can be returned to normal.

(11) Managing change. To properly manage changes to process chemicals, technology, equipment and facilities, one must define what is meant by change. In this process safety management standard, change includes all modifications to equipment, procedures, raw materials and processing conditions other than "replacement in kind." These changes need to be properly managed by identifying and reviewing them prior to implementation of the change. For example, the operating procedures contain the operating parameters (pressure limits, temperature ranges, flow rates, etc.) and the importance of operating within these limits. While the operator must have the flexibility to maintain safe operation within the established parameters, any operation outside of these parameters requires review and approval by a written management of change procedure. Management of change covers such as changes in process technology and changes to equipment and instrumentation. Changes in process technology can result from changes in production rates, raw materials, experimentation, equipment unavailability, new equipment, new product development, change in catalyst and changes in operating conditions to improve yield or quality. Equipment changes include among others change in materials of construction, equipment specifications, piping rearrangements, experimental equipment, computer program revisions and changes in alarms and interlocks. Employers need to establish means and methods to detect both technical changes and mechanical changes. Temporary changes have caused a number of catastrophes over the years, and employers need to establish ways to detect temporary changes as well as those that are permanent. It is important that a time limit for temporary changes be established and monitored since, without control, these changes may tend to become permanent. Temporary changes are subject to the management of change provisions. In addition,

the management of change procedures are used to insure that the equipment and procedures are returned to their original or designed conditions at the end of the temporary change. Proper documentation and review of these changes is invaluable in assuring that the safety and health considerations are being incorporated into the operating procedures and the process. Employers may wish to develop a form or clearance sheet to facilitate the processing of changes through the management of change procedures. A typical change form may include a description and the purpose of the change, the technical basis for the change, safety and health considerations, documentation of changes for the operating procedures, maintenance procedures, inspection and testing, P&IDs, electrical classification, training and communications, prestartup inspection, duration if a temporary change, approvals and authorization. Where the impact of the change is minor and well understood, a check list reviewed by an authorized person with proper communication to others who are affected may be sufficient. However, for a more complex or significant design change, a hazard evaluation procedure with approvals by operations, maintenance, and safety departments may be appropriate. Changes in documents such as P&IDs, raw materials, operating procedures, mechanical integrity programs, electrical classifications, etc., need to be noted so that these revisions can be made permanent when the drawings and procedure manuals are updated. Copies of process changes need to be kept in an accessible location to ensure that design changes are available to operating personnel as well as to PHA team members when a PHA is being done or one is being updated.

(12) Investigation of incidents. Incident investigation is the process of identifying the underlying causes of incidents and implementing steps to prevent similar events from occurring. The intent of an incident investigation is for employers to learn from past experiences and thus avoid repeating past mistakes. The incidents for which WISHA expects employers to become aware and to investigate are the types of events which result in or could reasonably have resulted in a catastrophic release. Some of the events are sometimes referred to as "near misses," meaning that a serious consequence did not occur, but could have. Employers need to develop in-house capability to investigate incidents that occur in their facilities. A team needs to be assembled by the employer and trained in the techniques of investigation including how to conduct interviews of witnesses, needed documentation and report writing. A multidisciplinary team is better able to gather the facts of the event and to analyze them and develop plausible scenarios as to what happened, and why. Team members should be selected on the basis of their training, knowledge and ability to contribute to a team effort to fully investigate the incident. Employees in the process area where the incident occurred should be consulted, interviewed, or made a member of the team. Their knowledge of the events form a significant set of facts about the incident which occurred. The report, its findings and recommendations are to be shared with those who can benefit from the information. The cooperation of employees is essential to an effective incident investigation. The focus of the investigation should be to obtain facts, and not to place blame. The team and the

investigation process should clearly deal with all involved individuals in a fair, open, and consistent manner.

(13) Emergency preparedness. Each employer must address what actions employees are to take when there is an unwanted release of highly hazardous chemicals. Emergency preparedness or the employer's tertiary (third) lines of defense are those that will be relied on along with the secondary lines of defense when the primary lines of defense which are used to prevent an unwanted release fail to stop the release. Employers will need to decide if they want employees to handle and stop small or minor incidental releases. Whether they wish to mobilize the available resources at the plant and have them brought to bear on a more significant release. Or whether employers want their employees to evacuate the danger area and promptly escape to a preplanned safe zone area, and allow the local community emergency response organizations to handle the release. Or whether the employer wants to use some combination of these actions. Employers will need to select how many different emergency preparedness or tertiary lines of defense they plan to have and then develop the necessary plans and procedures, and appropriately train employees in their emergency duties and responsibilities and then implement these lines of defense. Employers at a minimum must have an emergency action plan which will facilitate the prompt evacuation of employees due to an unwanted release of a highly hazardous chemical. This means that the employer will have a plan that will be activated by an alarm system to alert employees when to evacuate and, that employees who are physically impaired, will have the necessary support and assistance to get them to the safe zone as well. The intent of these requirements is to alert and move employees to a safe zone quickly. Delaying alarms or confusing alarms are to be avoided. The use of process control centers or similar process buildings in the process area as safe areas is discouraged. Recent catastrophes have shown that a large life loss has occurred in these structures because of where they have been sited and because they are not necessarily designed to withstand over-pressures from shockwaves resulting from explosions in the process area. Unwanted incidental releases of highly hazardous chemicals in the process area must be addressed by the employer as to what actions employees are to take. If the employer wants employees to evacuate the area, then the emergency action plan will be activated. For outdoor processes where wind direction is important for selecting the safe route to a refuge area, the employer should place a wind direction indicator such as a wind sock or pennant at the highest point that can be seen throughout the process area. Employees can move in the direction of cross wind to upwind to gain safe access to the refuge area by knowing the wind direction. If the employer wants specific employees in the release area to control or stop the minor emergency or incidental release, these actions must be planned for in advance and procedures developed and implemented. Preplanning for handling incidental releases for minor emergencies in the process area needs to be done, appropriate equipment for the hazards must be provided, and training conducted for those employees who will perform the emergency work before they respond to handle an actual release. The employer's training program, including the hazard communication standard training is to address the train-

ing needs for employees who are expected to handle incidental or minor releases. Preplanning for releases that are more serious than incidental releases is another important line of defense to be used by the employer. When a serious release of a highly hazardous chemical occurs, the employer through preplanning will have determined in advance what actions employees are to take. The evacuation of the immediate release area and other areas as necessary would be accomplished under the emergency action plan. If the employer wishes to use plant personnel such as a fire brigade, spill control team, a hazardous materials team, or use employees to render aid to those in the immediate release area and control or mitigate the incident, these actions are covered by WAC 296-62-300, the hazardous waste operations and emergency response (HAZWOPER) standard. If outside assistance is necessary, such as through mutual aid agreements between employers or local government emergency response organizations, these emergency responders are also covered by HAZWOPER. The safety and health protections required for emergency responders are the responsibility of their employers and of the on-scene incident commander. Responders may be working under very hazardous conditions and therefore the objective is to have them competently led by an on-scene incident commander and the commander's staff, properly equipped to do their assigned work safely, and fully trained to carry out their duties safely before they respond to an emergency. Drills, training exercises, or simulations with the local community emergency response planners and responder organizations is one means to obtain better preparedness. This close cooperation and coordination between plant and local community emergency preparedness managers will also aid the employer in complying with the Environmental Protection Agency's risk management plan criteria. One effective way for medium to large facilities to enhance coordination and communication during emergencies for on plant operations and with local community organizations is for employers to establish and equip an emergency control center. The emergency control center would be sited in a safe zone area so that it could be occupied throughout the duration of an emergency. The center would serve as the major communication link between the on-scene incident commander and plant or corporate management as well as with the local community officials. The communication equipment in the emergency control center should include a network to receive and transmit information by telephone, radio, or other means. It is important to have a backup communication network in case of power failure or one communication means fails. The center should also be equipped with the plant layout and community maps, utility drawings including fire water, emergency lighting, appropriate reference materials such as a government agency notification list, company personnel phone list, SARA Title III reports and material safety data sheets, emergency plans and procedures manual, a listing with the location of emergency response equipment, mutual aid information, and access to meteorological or weather condition data and any dispersion modeling data.

(14) Compliance audits. Employers need to select a trained individual or assemble a trained team of people to audit the process safety management system and program. A small process or plant may need only one knowledgeable per-

son to conduct an audit. The audit is to include an evaluation of the design and effectiveness of the process safety management system and a field inspection of the safety and health conditions and practices to verify that the employer's systems are effectively implemented. The audit should be conducted or led by a person knowledgeable in audit techniques and who is impartial towards the facility or area being audited. The essential elements of an audit program include planning, staffing, conducting the audit, evaluation and corrective action, follow-up and documentation. Planning in advance is essential to the success of the auditing process. Each employer needs to establish the format, staffing, scheduling, and verification methods prior to conducting the audit. The format should be designed to provide the lead auditor with a procedure or checklist which details the requirements of each section of the standard. The names of the audit team members should be listed as part of the format as well. The checklist, if properly designed, could serve as the verification sheet which provides the auditor with the necessary information to expedite the review and assure that no requirements of the standard are omitted. This verification sheet format could also identify those elements that will require evaluation or a response to correct deficiencies. This sheet could also be used for developing the follow-up and documentation requirements. The selection of effective audit team members is critical to the success of the program. Team members should be chosen for their experience, knowledge, and training and should be familiar with the processes and with auditing techniques, practices, and procedures. The size of the team will vary depending on the size and complexity of the process under consideration. For a large, complex, highly instrumented plant, it may be desirable to have team members with expertise in process engineering and design, process chemistry, instrumentation and computer controls, electrical hazards and classifications, safety and health disciplines, maintenance, emergency preparedness, warehousing or shipping, and process safety auditing. The team may use part-time members to provide for the depth of expertise required as well as for what is actually done or followed, compared to what is written. An effective audit includes a review of the relevant documentation and process safety information, inspection of the physical facilities, and interviews with all levels of plant personnel. Utilizing the audit procedure and checklist developed in the preplanning stage, the audit team can systematically analyze compliance with the provisions of the standard and any other corporate policies that are relevant. For example, the audit team will review all aspects of the training program as part of the overall audit. The team will review the written training program for adequacy of content, frequency of training, effectiveness of training in terms of its goals and objectives as well as to how it fits into meeting the standard's requirements, documentation, etc. Through interviews, the team can determine the employee's knowledge and awareness of the safety procedures, duties, rules, emergency response assignments, etc. During the inspection, the team can observe actual practices such as safety and health policies, procedures, and work authorization practices. This approach enables the team to identify deficiencies and determine where corrective actions or improvements are necessary. An audit is a technique used to gather sufficient facts

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and information, including statistical information, to verify compliance with standards. Auditors should select as part of their preplanning a sample size sufficient to give a degree of confidence that the audit reflects the level of compliance with the standard. The audit team, through this systematic analysis, should document areas which require corrective action as well as those areas where the process safety management system is effective and working in an effective manner. This provides a record of the audit procedures and findings, and serves as a baseline of operation data for future audits. It will assist future auditors in determining changes or trends from previous audits. Corrective action is one of the most important parts of the audit. It includes not only addressing the identified deficiencies, but also planning, followup, and documentation. The corrective action process normally begins with a management review of the audit findings. The purpose of this review is to determine what actions are appropriate, and to establish priorities, timetables, resource allocations, and requirements and responsibilities. In some cases, corrective action may involve a simple change in procedure or minor maintenance effort to remedy the concern. Management of change procedures need to be used, as appropriate, even for what may seem to be a minor change. Many of the deficiencies can be acted on promptly, while some may require engineering studies or indepth review of actual procedures and practices. There may be instances where no action is necessary and this is a valid response to an audit finding. All actions taken, including an explanation where no action is taken on a finding, needs to be documented as to what was done and why. It is important to assure that each deficiency identified is addressed, the corrective action to be taken noted, and the audit person or team responsible be properly documented by the employer. To control the corrective action process, the employer should consider the use of a tracking system. This tracking system might include periodic status reports shared with affected levels of management, specific reports such as completion of an engineering study, and a final implementation report to provide closure for audit findings that have been through management of change, if appropriate, and then shared with affected employees and management. This type of tracking system provides the employer with the status of the corrective action. It also provides the documentation required to verify that appropriate corrective actions were taken on deficiencies identified in the audit.

[Statutory Authority: Chapter 49.17 RCW. 93-21-075 (Order 93-06), § 296-67-291, filed 10/20/93, effective 12/1/93; 92-17-022 (Order 92-06), § 296-67-291, filed 8/10/92, effective 9/10/92.]

WAC 296-67-293 Appendix D—Sources of further information (nonmandatory). (1) Center for Chemical Process Safety, American Institute of Chemical Engineers, 345 East 47th Street, New York, NY 10017, (212) 705-7319.

(2) "Guidelines for Hazard Evaluation Procedures," American Institute of Chemical Engineers; 345 East 47th Street, New York, NY 10017.

(3) "Guidelines for Technical Management of Chemical Process Safety," Center for Chemical Process Safety of the American Institute of Chemical Engineers; 345 East 47th Street, New York, NY 10017.

[Title 296 WAC—p. 1807]

(4) "Evaluating Process Safety in the Chemical Industry," Chemical Manufacturers Association; 2501 M Street NW, Washington, DC 20037.

(5) "Safe Warehousing of Chemicals," Chemical Manufacturers Association; 2501 M Street NW, Washington, D.C. 20037.

(6) "Management of Process Hazards," American Petroleum Institute (API Recommended Practice 750); 1220 L Street, N.W., Washington, D.C. 20005.

(7) "Improving Owner and Contractor Safety Performance," American Petroleum Institute (API Recommended Practice 2220); API, 1220 L Street N.W., Washington, D.C. 20005.

(8) Chemical Manufacturers Association (CMA's Manager Guide), First Edition, September 1991; CMA, 2501 M Street, N.W., Washington, D.C. 20037.

(9) "Improving Construction Safety Performance," Report A-3, The Business Roundtable; The Business Roundtable, 200 Park Avenue, New York, NY 10166. (Report includes criteria to evaluate contractor safety performance and criteria to enhance contractor safety performance).

(10) "Recommended Guidelines for Contractor Safety and Health," Texas Chemical Council; Texas Chemical Council, 1402 Nueces Street, Austin, TX 78701-1534.

(11) "Loss Prevention in the Process Industries," Volumes I and II; Frank P. Lees, Butterworth; London 1983.

(12) "Safety and Health Program Management Guidelines," 1989; U.S. Department of Labor, Occupational Safety and Health Administration.

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(14) "Review of Emergency Systems," June 1988; U.S. Environmental Protection Agency (EPA), Office of Solid Waste and Emergency Response, Washington, D.C. 20460.

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(16) "Accident Investigation*** A New Approach," 1983, National Safety Council; 444 North Michigan Avenue, Chicago, IL 60611-3991.

(17) "Fire Explosion Index Hazard Classification Guide," 6th Edition, May 1987, Dow Chemical Company; Midland, Michigan 48674.

(18) "Chemical Exposure Index," May 1988, Dow Chemical Company; Midland, Michigan 48674.

[Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-67-293, filed 8/10/92, effective 9/10/92.]

Chapter 296-78 WAC

SAFETY STANDARDS FOR SAWMILLS AND WOODWORKING OPERATIONS

WAC

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296-78-835	Vehicles.		
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296-78-84003	Conveyors.		
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296-78-84007	Chippers and hogs.		
296-78-84009	Bins and bunkers.	296-78-100	Electrical utilization—Suitability and size of conductors. [Rule D-32, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
296-78-84011	Burners.		
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296-78-005	Foreword. [Order 76-7, § 296-78-005, filed 3/1/76; Order 74-28, § 296-78-005, filed 5/7/74; Foreword, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.	296-78-105	Electrical utilization—Fuses and circuit breakers. [Rule D-33, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
296-78-007	Definitions applicable to this chapter. [Order 74-28, § 296-78-007, filed 5/7/74.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.	296-78-110	Electrical utilization—General requirements for switches—Accessibility, marking and installation. [Rule D-34, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
296-78-010	General safety standards. [Rules A-1 through A-19, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.	296-78-115	Electrical utilization—Guarding switches. [Rule D-35, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
296-78-015	Minimum requirements for first aid. [Rule B-1, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.	296-78-120	Electrical utilization—Platforms and mats. [Rule D-36, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
296-78-020	First-aid kit. [Rule B-2, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.	296-78-125	Electrical utilization—Switchboards and panelboards—Control or arrangement. [Rule D-37, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
296-78-025	First-aid room. [Rule B-3, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.	296-78-130	Electrical utilization—Inclosure of parts. [Rule D-38, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
296-78-030	Construction and isolated equipment. [Order 77-12, § 296-78-030, filed 7/11/77; Order 76-7, § 296-78-030, filed 3/1/76; Order 74-28, § 296-78-030, filed 5/7/74; Rules C-1 through C-61, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.	296-78-135	Electrical utilization—Motors and motor-driven machinery—Grounding machine frames. [Rule D-39, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
296-78-035	Mechanical, steam and electrical equipment—General provisions. [Order 74-28, § 296-78-035, filed 5/7/74; Rules D-1 through D-19, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.	296-78-140	Electrical utilization—Mats and platforms. [Rule D-40, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
296-78-040	Boiler and pressure vessels. [Order 74-28, § 296-78-040, filed 5/7/74; Rule D-20, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.	296-78-145	Electrical utilization—Water barrel rheostats prohibited. [Rule D-41, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
296-78-045	Electrical service and equipment. [Order 74-28, § 296-78-045, filed 5/7/74; Rule D-21, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.	296-78-150	Electrical utilization—Employees—Safety requirements. [Rule D-42, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
296-78-050	Electrical utilization—Definitions. [Rule D-22, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.	296-78-155	Electrical utilization—"Bridging" fuses prohibited. [Rule D-43, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
296-78-055	Electrical utilization—General requirements—Safety. [Rule D-23, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.	296-78-160	Electrical utilization—Leakage of electricity shall be reported. [Rule D-44, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
296-78-060	Electrical utilization—General requirements—Current. [Rule D-24, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.	296-78-162	Electrical utilization—Safe standing room required. [Rule D-45, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
296-78-065	Electrical utilization—General requirements—Grounding. [Rule D-25, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.	296-78-165	Electrical utilization—Use of disconnected wires for starting machinery prohibited. [Rules D-46 through D-53, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
296-78-070	Electrical utilization—General requirements—Circuits to be grounded. [Rule D-26, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.	296-78-170	Elevators, moving walks and other lifting devices. [Order 76-29, § 296-78-170, filed 9/30/76; Order 74-28, § 296-78-170, filed 5/7/74; Rule D-54, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.

- 296-78-175 Platform hoists. [Rule D-55, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-180 Transportation—Lumber handling equipment—Cranes—Construction. [Order 74-28, § 296-78-180, filed 5/7/74; Rule E-1, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-185 Electrical equipment. [Order 74-28, § 296-78-185, filed 5/7/74; Rule E-2, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-190 Chains, wire rope, cables and fiber rope. [Order 74-28, § 296-78-190, filed 5/7/74; Rule E-3, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-195 Floor operated cranes. [Order 74-28, § 296-78-195, filed 5/7/74; Rule E-4, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-200 Operators. [Order 77-12, § 296-78-200, filed 7/11/77; Order 74-28, § 296-78-200, filed 5/7/74; Rule E-5, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-205 Signalmen. [Order 74-28, § 296-78-205, filed 5/7/74; Rule E-6, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-210 Repairmen. [Order 74-28, § 296-78-210, filed 5/7/74; Rule E-7, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-215 Construction requirements. [Order 74-28, § 296-78-215, filed 5/7/74; Rule E-8, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-220 Crane platforms and footwalks. [Order 74-28, § 296-78-220, filed 5/7/74; Rule E-9, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-225 Crane cages. [Order 74-28, § 296-78-225, filed 5/7/74; Rule E-10, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-230 Crane rail stops, bumpers and fenders. [Order 74-28, § 296-78-230, filed 5/7/74; Rule E-11, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-235 Crawler locomotive and truck cranes. [Order 74-28, § 296-78-235, filed 5/7/74; Rule E-12, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-240 Construction, operation and maintenance—Chain and electric hoists. [Order 74-28, § 296-78-240, filed 5/7/74; Rule E-13, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-245 Monorail hoists. [Order 74-28, § 296-78-245, filed 5/7/74; Rule E-14, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-250 Air hoists. [Order 74-28, § 296-78-250, filed 5/7/74; Rule E-15, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-255 Jib, pillar, and portable floor cranes, crabs, and winches. [Order 74-28, § 296-78-255, filed 5/7/74; Rule E-16, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-260 Standard crane hand signals—Illustration. [Order 74-28, § 296-78-260, filed 5/7/74; Rule E-17, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-265 Vehicles. [Order 77-12, § 296-78-265, filed 7/11/77; Order 74-28, § 296-78-265, filed 5/7/74; Rules E-18 through E-39, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-270 Loading, piling, storage and conveying. [Order 76-7, § 296-78-270, filed 3/1/76; Order 74-28, § 296-78-270, filed 5/7/74; Rules F-1 through F-43, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-275 Log dumps and ponds—Headmills. [Order 76-7, § 296-78-275, filed 3/1/76; Order 74-28, § 296-78-275, filed 5/7/74; Rules G-1 through G-50, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-280 Band saws—Saws. [Order 76-7, § 296-78-280, filed 3/1/76; Order 74-28, § 296-78-280, filed 5/7/74; Rule H-1, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-285 Circular saws. [Order 74-28, § 296-78-285, filed 5/7/74; Rule H-2, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-290 Edgers. [Order 77-12, § 296-78-290, filed 7/11/77; Order 76-7, § 296-78-290, filed 3/1/76; Order 74-28, § 296-78-290, filed 5/7/74; Rules H-3A through H-3I, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-295 Equalizer saws. [Order 74-28, § 296-78-295, filed 5/7/74; Rule H-4, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-300 Gang saws and re-saws. [Order 74-28, § 296-78-300, filed 5/7/74; Rule H-5, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-305 Jump saws. [Order 74-28, § 296-78-305, filed 5/7/74; Rule H-6, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-310 Saws—Shingle saws. [Rule H-7, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-315 Trimmer and slasher saws. [Order 74-28, § 296-78-315, filed 5/7/74; Rule H-8, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-320 Barrel stave saws. [Order 74-28, § 296-78-320, filed 5/5/74; Rule H-9, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-325 Swing saws. [Order 74-28, § 296-78-325, filed 5/7/74; Rule H-10, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-330 Table saws. [Order 74-28, § 296-78-330, filed 5/7/74; Rule H-11, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-335 Circular saws, speeds, repairs. [Order 74-28, § 296-78-335, filed 5/7/74; Rule H-12, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-340 Saw filing and grinding rooms and equipment. [Order 74-28, § 296-78-340, filed 5/7/74; Rule H-13, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-345 Miscellaneous woodworking machines—Planers, stickers, molders, matchers. [Order 74-28, § 296-78-345, filed 5/7/74; Rule I-1, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81.

- Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-350 Planers (stave and heading). [Order 74-28, § 296-78-350, filed 5/7/74; Rule 1-2, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-355 Stave croziers. [Order 74-28, § 296-78-355, filed 5/7/74; Rule 1-3, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-360 Jointers. [Order 74-28, § 296-78-360, filed 5/7/74; Rule 1-4, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-365 Jointers (stave and heading). [Order 74-28, § 296-78-365, filed 5/7/74; Rule 1-5, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-370 Miscellaneous woodworking machines—Jointers—(Shingle). [Rule 1-6, effective 6/1/51, filed 3/23/60.] Repealed by Order 74-28, filed 5/7/74 and Order 76-7, filed 3/1/76.
- 296-78-375 Wood shapers. [Order 74-28, § 296-78-375, filed 5/7/74; Rule 1-7, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-380 Boring and mortising machines. [Order 74-28, § 296-78-380, filed 5/7/74; Rule 1-8, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-385 Tenoning machines. [Order 74-28, § 296-78-385, filed 5/7/74; Rule 1-9, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-390 Lathe (pail and barrel). [Order 74-28, § 296-78-390, filed 5/7/74; Rule 1-10, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-395 Sanding machines. [Order 74-28, § 296-78-395, filed 5/7/74; Rule 1-11, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-400 Glue machines. [Order 74-28, § 296-78-400, filed 5/7/74; Rule 1-12, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-405 Lath mills. [Order 74-28, § 296-78-405, filed 5/7/74; Rule J-1, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-410 Veneer and plywood plants—Peeling and barking. [Order 74-28, § 296-78-410, filed 5/7/74; Rule K-1, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-415 Veneer lathe. [Order 74-28, § 296-78-415, filed 5/7/74; Rules K-2 through K-4, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-420 Veneer slicer and cutter. [Order 74-28, § 296-78-420, filed 5/7/74; Rule K-5, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-425 Veneer clipper. [Order 74-28, § 296-78-425, filed 5/7/74; Rule K-6, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.
- 296-78-430 Veneer wringer (swede). [Order 74-28, § 296-78-430, filed 5/7/74; Rule K-7, effective 6/1/51, filed 3/23/60.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.

296-78-450 The shake and shingle industry. [Order 76-7, § 296-78-450, filed 3/1/76; Order 74-28, § 296-78-450, filed 5/7/74.] Repealed by 81-18-029 (Order 81-21), filed 8/27/81. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240.

WAC 296-78-500 Foreword. (1) General requirements. The chapter 296-78 WAC shall apply to and include safety requirements for all installations where the primary manufacturing of wood building products takes place. The installations may be a permanent fixed establishment or a portable operation. These operations shall include but are not limited to log and lumber handling, sawing, trimming and planing, plywood or veneer manufacturing, canting operations, waste or residual handling, operation of dry kilns, finishing, shipping, storage, yard and yard equipment, and for power tools and affiliated equipment used in connection with such operation. WAC 296-78-450 shall apply to shake and shingle manufacturing. The provisions of WAC 296-78-500 through 296-78-84011 are also applicable in shake and shingle manufacturing except in instances of conflict with the requirements of WAC 296-78-705. (Rev. 1-28-76.)

(2) This standard shall augment the Washington state general safety and health standards, general occupational health standards, electrical workers safety rules, and any other standards which are applicable to all industries governed by chapter 80, Laws of 1973, Washington Industrial Safety and Health Act. In the event of any conflict between any portion of this chapter and any portion of any of the general application standards, the provisions of this chapter 296-78 WAC, shall apply.

(3) In exceptional cases where compliance with specific provisions of this chapter can only be accomplished to the serious detriment and disadvantage of an operation, variance from the requirement may be permitted by the director of the department of labor and industries after receipt of application for variance which meets the requirements of WAC 296-24-010, general safety and health standards.

(4) No safety program will run itself. To be successful, the wholehearted interest of the employees' group (labor unions) and management must not only be behind the program, but the fact must also be readily apparent to all.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-18-029 (Order 81-21), § 296-78-500, filed 8/27/81.]

WAC 296-78-505 Definitions applicable to this chapter. (1) "A-frame" means a structure made of two independent columns fastened together at the top and separated at the bottom for stability.

(2) "Annealing" heating then cooling to soften and render less brittle.

(3) "Binder" a hinged lever assembly used to connect the ends of a wrapper to tighten the wrapper around the load of logs or materials.

(4) "Boom" logs or timbers fastened together end to end and used to contain floating logs. The term includes enclosed logs.

(5) "Brow log" a log placed parallel to a roadway at a landing or dump to protect vehicles while loading or unloading.

(6) "Bunk" a cross support for a load.

(7) "Cant" a log slabbed on one or more sides.

(8) "Carriage" (log carriage) a framework mounted on wheels which runs on tracts or in grooves in a direction parallel to the face of the saw, and which contains apparatus to hold a log securely and advance it toward the saw.

(9) "Carrier" an industrial truck so designed and constructed that it straddles the load to be transported with mechanisms to pick up the load and support it during transportation.

(10) "Chipper" a machine which cuts material into chips.

(11) "Chock," "bunk block," and "cheese block" a wedge that prevents logs or loads from moving.

(12) "Cold deck" a pile of logs stored for future removal.

(13) "Crotch lines" two short lines attached to a hoisting line by a ring or shackle, the lower ends being attached to loading hooks.

(14) "Dog" (carriage dog) a steel tooth or assembly of steel teeth, one or more of which are attached to each carriage knee to hold log firmly in place on carriage.

(15) "Drag saw" a power-driven, reciprocating cross-cut saw mounted on suitable frame and used for bucking logs.

(16) "Head block" that part of a carriage which holds the log and upon which it rests. It generally consists of base, knee, taper set, and mechanism.

(17) "Head rig" a combination of head saw and log carriage used for the initial breakdown of logs into timbers, cants, and boards.

(18) "Hog" a machine for cutting or grinding slabs and other coarse residue from the mill.

(19) "Husk" a head saw framework on a circular mill.

(20) "Industrial truck" a mobile, power-driven vehicle used to carry, push or pull material. It is designed for "in-plant" or "on-site" use rather than highway use.

(21) "Kiln tender" the operator of a kiln.

(22) "Lift truck" an industrial truck used for lateral transportation and equipped with a power-operated lifting device, usually in the form of forks, for piling or unpling lumber units or packages.

(23) "Live rolls" cylinders of wood or metal mounted on horizontal axes and rotated by power, which are used to convey slabs, lumber, and other wood products.

(24) "Loading boom" any structure projecting from a pivot point and intended to be used for lifting and guiding loads for the purpose of loading or unloading.

(25) "Log" a portion of a tree, usually a minimum of twelve feet in length, capable of being further processed into a variety of wood products.

(26) "Log deck" a platform in the sawmill on which the logs remain until needed for sawing.

(27) "Log haul" a conveyor for transferring logs to mill.

(28) "Lumber dimensions" the nominal size of surfaced lumber, unless otherwise stated.

(29) "Lumber hauling truck" an industrial truck, other than a lift truck or a carrier, used for the transport of lumber.

(30) "Package" a unit of lumber.

(31) "Peavy" a stout wooden handle fitted with a spike and hook and used for rolling logs.

(32) "Peeler block" a portion of a tree usually bucked in two foot intervals plus trim, to be peeled in a lathe or sliced in a slicer into veneer for further processing into plywood.

(33) "Pike pole" a long pole whose end is shod with a sharp pointed spike.

(34) "Pitman rod" connecting rod.

(35) "Resaw" band, circular, or sash gang saws used to break down slabs, cants, or flitches into lumber.

(36) "Running line" any moving rope as distinguished from a stationary rope such as a guyline.

(37) "Safety factor" a calculated reduction factor which may be applied to laboratory test values to obtain safe working stresses for wooden beams and other mechanical members; ratio of breaking load to safe load.

(38) "Saw guide" a device for steadying a circular or bandsaw.

(39) "Setwork" a mechanism on a sawmill carriage which enables an operator to move the log into position for another cut.

(40) "Sorting gaps" the areas on a log pond enclosed by boom sticks into which logs are sorted.

(41) "Spreader wheel" a metal wheel that separates the board from the log in back of circular saws to prevent binding.

(42) "Splitter" a knife-type, nonrotating spreader.

(43) "Sticker" a strip of wood or other material used to separate layers of lumber.

(44) "Stiff boom" the anchored, stationary boom sticks which are tied together and on which boom persons work.

(45) "Swifter" is a tying of boom sticks together to prevent them from spreading while being towed.

(46) "Telltale" a device used to serve as a warning for overhead objects.

(47) "Top saw" the upper of two circular saws on a head rig, both being on the same husk.

(48) "Tramway" a way for trams, usually consisting of parallel tracks laid on wooden beams.

(49) "Trestle" a braced framework of timbers, piles or steelwork for carrying a road or railroad over a depression.

(50) "Wrapper" a chain, strap or wire rope assembly used to contain a load of logs or materials.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-505, filed 8/27/81.]

WAC 296-78-510 Education and first-aid standards.

It shall be the duty of every employer to comply with such standards and systems of education for safety as shall be, from time to time, prescribed for such employer by the director of labor and industries through the division of industrial safety and health or by statute.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-510, filed 8/27/81.]

WAC 296-78-515 Management's responsibility. (1) It

shall be the responsibility of management to establish, supervise, and enforce, in a manner which is effective in practice:

(a) A safe and healthful working environment.

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

(c) Training programs to improve the skill and competency of all employees in the field of occupational safety and health. Such training shall include the on-the-job instructions on the safe use of powered materials handling equipment,

machine tool operations, use of toxic materials and operation of utility systems prior to assignments to jobs involving such exposures.

(2) The employer shall develop and maintain a hazard communication program as required by chapter 296-62 WAC, Part C, which will provide information to all employees relative to hazardous chemicals or substances to which they are exposed, or may become exposed, in the course of their employment.

(3) Management shall not assign mechanics, millwrights, or other persons to work on equipment by themselves when there is a probability that the person could fall from elevated work locations or equipment or that a person could be pinned down by heavy parts or equipment so that they could not call for or obtain assistance if the need arises.

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

(4) After the emergency actions following accidents that cause serious injuries that have immediate symptoms, a preliminary investigation of the cause of the accident shall be conducted. The investigation shall be conducted by a person designated by the employer, the immediate supervisor of the injured employee, witnesses, employee representative if available and any other person with the special expertise required to evaluate the facts relating to the cause of the accident. The findings of the investigation shall be documented by the employer for reference at any following formal investigation.

(5) Reporting of fatality or multiple hospitalization incidents.

(a) Within eight hours after the fatality or probable fatality of any employee from a work-related incident or the inpatient hospitalization of two or more employees as a result of a work-related incident, the employer of any employees so affected shall report the fatality/multiple hospitalization by telephone or in person, to the nearest office of the department or by using the OSHA toll-free central telephone number, 1-800-321-6742.

(i) This requirement applies to each such fatality or hospitalization of two or more employees which occurs within thirty days of the incident.

(ii)

Exception: If any employer does not learn of a reportable incident at the time it occurs and the incident would otherwise be reportable under this subsection, the employer shall make a report within eight hours of the time the incident is reported to any agent or employee of the employer.

(iii) Each report required by this subsection shall relate the following information: Establishment name, location of the incident, time of the incident, number of fatalities or hospitalized employees, contact person, phone number, and a brief description of the incident.

(b) Equipment involved in an incident resulting in an immediate or probable fatality or in the in-patient hospitalization of two or more employees, shall not be moved, until a

representative of the department investigates the incident and releases such equipment, except where removal is essential to prevent further incident. Where necessary to remove the victim, such equipment may be moved only to the extent of making possible such removal.

(c) Upon arrival of a department investigator, employer shall assign to assist the investigator, the immediate supervisor and all employees who were witnesses to the incident, or whoever the investigator deems necessary to complete the investigation.

(6) A system for maintaining records of occupational injuries and illnesses as prescribed by chapter 296-27 WAC.

Note: Recordable cases include:

- (a) Every occupational death.
- (b) Every industrial illness.
- (c) Every occupational injury that involves one of the following:
 - (i) Unconsciousness.
 - (ii) Inability to perform all phases of regular job.
 - (iii) Inability to work full time on regular job.
 - (iv) Temporary assignment to another job.
 - (v) Medical treatment beyond first aid.

All employers with eleven or more employees shall record occupational injury and illness information on forms OSHA 101 - supplementary record occupational injuries and illnesses and OSHA 200 - log and summary. Forms other than OSHA 101 may be substituted for the supplementary record of occupational injuries and illnesses if they contain the same items.

[Statutory Authority: Chapter 49.17 RCW, 94-20-057 (Order 94-16), § 296-78-515, filed 9/30/94, effective 11/20/94; 91-24-017 (Order 91-07), § 296-78-515, filed 11/22/91, effective 12/24/91; 89-11-035 (Order 89-03), § 296-78-515, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-515, filed 8/27/81.]

WAC 296-78-520 Employee's responsibility. (1) Employees shall coordinate and cooperate with all other employees in an attempt to eliminate accidents.

(2) Employees shall study and observe all safe practices governing their work.

(3) Employees should offer safety suggestions, wherein such suggestions may contribute to a safer work environment.

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

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

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

(7) Employees shall not wear torn or loose clothing while working around machinery.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-520, filed 8/27/81.]

WAC 296-78-525 Accident-prevention programs. Each employer shall develop a formal accident-prevention program, tailored to the needs of the particular plant or operation and to the type of hazards involved. The department

may be contacted for assistance in developing appropriate programs.

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

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

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

(ii) How to report unsafe conditions and practices.

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

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

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

(vi) A description of the employers total safety program.

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

(b) A designated safety and health committee consisting of management and employee representatives with the employee representatives being elected or appointed by fellow employees.

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

[Statutory Authority: Chapter 49.17 RCW, 94-20-057 (Order 94-16), § 296-78-525, filed 9/30/94, effective 11/20/94. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-18-029 (Order 81-21), § 296-78-525, filed 8/27/81.]

WAC 296-78-530 Safety and health committee plan.

(1) All employers of eleven or more employees, shall have a designated safety committee composed of employer and employee elected members.

(a) The terms of employee-elected members shall be a maximum of one year. Should a vacancy occur on the committee, a new member shall be elected prior to the next scheduled meeting.

(b) The number of employer-selected members shall not exceed the number of employee-elected members.

(2) The safety committee shall have an elected chairperson.

(3) The safety committee shall be responsible for determining the frequency of committee meetings.

Note: If the committee vote on the frequency of safety meetings is stalemated, the division's regional safety educational representative may be consulted for recommendations.

(a) The committee shall be responsible for determining the date, hour and location of the meetings.

(b) The length of each meeting shall not exceed one hour except by majority vote of the committee.

(4) Minutes of each committee meeting shall be prepared and filed for a period of at least one year and shall be made available for review by noncompliance personnel of the division of industrial safety and health.

(5) Safety and health committee meetings shall address the following:

(a) A review of the safety and health inspection reports to assist in correction of identified unsafe conditions or practices.

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

(c) An evaluation of the accident or illness prevention program with the discussion of recommendation for improvement where indicated.

(d) The attendance shall be documented.

(e) The subject(s) discussed shall be documented.

(6) All employers of ten or less employees and employers of eleven or more employees where the employees are segregated on different shifts or in widely dispersed locations in crews of ten or less employees, may elect to have foreman-crew meetings in lieu of a safety and health committee plan provided:

(a) Foreman-crew safety meetings be held at least once a month, however, if conditions require, weekly or semi-monthly meetings shall be held to discuss safety problems as they arise.

(b) All items under subsection (5) of this section shall be covered.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-18-029 (Order 81-21), § 296-78-530, filed 8/27/81.]

WAC 296-78-535 Safety bulletin board. There shall be installed and maintained in every fixed establishment, a safety bulletin board sufficient in size to display and post safety bulletins, newsletters, posters, accident statistics and other safety educational material. It is recommended that safety bulletin boards be painted green and white.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-18-029 (Order 81-21), § 296-78-535, filed 8/27/81.]

WAC 296-78-540 First-aid training and certification.

The purpose of this section is to assure that all employees of this state can be afforded quick, and effective first-aid attention in the event that an injury occurs on the job. The means of achieving this purpose is to assure the presence of personnel trained in first-aid procedures at or near those places where employees are working. Compliance with the provisions of this section may require the presence of more than one first-aid trained person.

(1) In addition to RCW 51.36.030, every employer shall comply with the department's requirements for first-aid training and certification.

(2) There shall be present or available at all times, a person or persons holding a valid certificate of first-aid training. (A valid first-aid certificate is one which is less than three years old.)

(3) Compliance with the requirements of subsection (2) of this section may be achieved as follows:

(a) All foremen, supervisors, or persons in direct charge of crews working in physically dispersed operations, shall have a valid first-aid certificate: *Provided*, That if the duties or work of the foreman, supervisor or person in direct charge of a crew, is absent from the crew, another person holding a valid first-aid certificate shall be present. For the purpose of

this section, a crew shall mean a group of two or more employees working at a work site separate and remote from the main office or fixed work place (such as occurs in construction, logging, etc.). In emergencies, foremen will be permitted to work up to thirty days without having the required certificate, providing an employee in the crew or another foreman in the immediate work area has the necessary certificate.

(b) In fixed establishments, all foremen, supervisors, or persons in direct charge if a group or groups of employees shall have a valid first-aid certificate: *Provided*, That in fixed establishments where the foreman, supervisor, or person in charge has duties which require his absence from the work site of the group, another person holding a valid first-aid certificate shall be present or available to the groups. Foremen, supervisors or persons in direct charge of a group or groups of employees will be permitted to work up to thirty days without having the required certificate, providing an employee in the crew or another foreman in the immediate work area has the necessary certificate.

(c) In fixed establishments organized into distinct departments or equivalent organizational units such as department stores, large company offices, etc., a person or persons holding a valid first-aid certificate shall be present or available at all times employees are working within that department or organizational unit.

(d) In small businesses, offices or similar types of fixed workplaces, compliance may be achieved by having a number of such small businesses, offices, etc., combined into a single unit for the purpose of assuring the continued presence or availability of a person or persons holding a valid first-aid training certificate. A plan for combining a number of small businesses, etc., into such a group shall be submitted to the division of industrial safety and health, safety education section, for approval. That section is also available to assist employers who wish to develop such a plan. Criteria for approval by the division shall include:

(i) The businesses within the group must not be widely dispersed;

(ii) The name(s) of the person or persons holding the first-aid certificate, their usual places of work, their work phone numbers, and other appropriate information shall be posted in each establishment which is a member of the group, in a place which can reasonably be expected to give notice to employees of that establishment;

(iii) First-aid kits shall be available and maintained as required by WAC 296-24-065.

(e) Valid certification shall be achieved by passing a course of first-aid instruction and participation in practical application of the following subject matter:

- Bleeding control and bandaging.
- Practical methods of artificial respiration including mouth to mouth to nose resuscitation.
- Closed chest heart massage.
- Poisons.
- Shock, unconsciousness, stroke.
- Burns, scalds.
- Sunstroke, heat exhaustion.
- Frostbite, freezing, hypothermia.
- Strains, sprains, hernias.

Fractures, dislocations.

Proper transportation of the injured.

Bites, stings.

Subjects covering specific health hazards likely to be encountered by co-workers of first-aid students enrolled in the course.

(4) Industrial first-aid course instructors will, upon request, be furnished by the division of industrial safety and health, department of labor and industries, either directly or through a program with the community colleges or vocational education.

(5) Employers of employees working in fixed establishments, meeting the following criteria, are exempt from the requirements of this section: *Provided*

(a) They can submit written evidence to the department upon request, that the worksite of their employees is within a two minute time frame of response by an aid car, medic unit or established ambulance service with first-aid trained attendants.

(b) There is a back-up aid car, medic unit or established ambulance service within the two minute response time; or that a first-aid trained person with readily available transportation is on the site of the posted emergency phone number for immediate dispatch in the event the primary unit is not available.

(c) There are no traffic impediments, such as draw bridges, railroad tracks, etc., along the normal route of travel of the aid car, medic unit or established ambulance service that would delay arrival beyond the required two minute time frame.

(d) Emergency telephone numbers are posted on all first-aid kits and at all telephones on the worksite.

(e) The above services are available or exist at all times when more than one employee is on the worksite.

Note: A construction site that will be of more than six months duration, such as a large building, shall be considered a fixed establishment for the purposes of this section. Doctor's offices and clinics are not to be considered as alternates due to the fact that very often doctor's schedules require them to be away from their offices.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-540, filed 8/27/81.]

WAC 296-78-545 First-aid kit. (1) All employers who employ men and women covered by the Industrial Safety and Health Act shall furnish first-aid kits as required by the division of industrial safety and health, department of labor and industries, (RCW 51.36.030).

(2) First-aid supplies shall be readily accessible when required.

(3) In the absence of readily accessible first-aid supplies such as first-aid kits, first-aid stations, first-aid rooms or their equivalent, all crew trucks, power shovels, cranes, locomotives, loaders, dozers, logging trucks, speeders, freight trucks and similar equipment shall be equipped with not less than a ten package first-aid kit.

(4) All crew vehicles used for transporting workers shall be equipped with not less than a ten package first-aid kit. When more than five employees are being transported on any one trip, the kit shall be increased in size to comply with a 16,

24, or 36 package kit depending upon the number of personnel normally being transported.

(5) At least one first-aid kit shall be available on construction jobs, line crews, and other transient or short duration jobs. The size and quantity of first-aid kits, required to be located at any site, shall be determined by the number of personnel normally dependent upon each kit as outlined in the following table:

NUMBER OF PERSONNEL NORMALLY ASSIGNED TO WORKSITE	MINIMUM FIRST-AID SUPPLIES REQUIRED AT WORKSITE
1 - 50 persons	First-Aid Kit
1 - 5	10 package kit
6 - 15	16 package kit
16 - 30	24 package kit
31 - 50	36 package kit
51 - 200 persons	First-Aid Station
51 - 75	One 36 and one 10 package kit
76 - 100	One 36 and one 16 package kit
101 - 150	One 36 and one 24 package kit
151 - 200	Two 36 package kits
Over 200 persons	First-Aid Room Refer to WAC 296-24-070

(6) Employers shall establish a procedure to assure that first-aid kits and required contents are maintained in a serviceable condition.

(7) First-aid kits shall contain at least the following items:

10 Package Kit

- 1 Pkg. adhesive bandages, 1" (16 per pkg.)
- 1 Pkg. bandage compress, 4" (1 per pkg.)
- 1 Pkg. scissors* and tweezers (1 each per pkg.)
- 1 Pkg. triangular bandage, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 5 Pkgs. of consulting physician's choice**

16 Package Kit

- 1 Pkg. absorbent gauze, 24" x 72" (1 per pkg.)
- 1 Pkg. adhesive bandages, 1" (16 per pkg.)
- 2 Pkgs. bandage compresses, 4" (1 per pkg.)
- 1 Pkg. eye dressing (1 per pkg.)
- 1 Pkg. scissors* and tweezers (1 each per pkg.)
- 2 Pkgs. triangular bandages, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 7 Pkgs. of consulting physician's choice**

24 Package Kit

- 2 Pkgs. absorbent gauze, 24" x 72" (1 per pkg.)
- 2 Pkgs. adhesive bandages, 1" (16 per pkg.)
- 2 Pkgs. bandage compresses, 4" (1 per pkg.)
- 1 Pkg. eye dressing (1 per pkg.)
- 1 Pkg. scissors* and tweezers (1 each per pkg.)
- 6 Pkgs. triangular bandages (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 9 Pkgs. of consulting physician's choice**

36 Package Kit

- 4 Pkgs. absorbent gauze, 24" x 72" (1 per pkg.)
- 2 Pkgs. adhesive bandages, 1" (16 per pkg.)
- 5 Pkgs. bandage compresses, 4" (1 per pkg.)
- 2 Pkgs. eye dressing (1 per pkg.)
- 1 Pkg. scissors* and tweezers (1 each per pkg.)
- 8 Pkgs. triangular bandages, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 13 Pkgs. of consulting physician's choice**

* Scissors shall be capable of cutting 2 layers of 15 oz. cotton cloth or its equivalent.

** First-aid kits shall be maintained at the ten, sixteen, twenty-four or thirty-six package level. In the event the consulting physician chooses not to recommend items, the department of labor and industries shall be contacted for recommended items to complete the kit.

(8) Where the eyes or body of any person may be exposed to injurious chemicals and/or materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided, within the work area, for immediate emergency use.

(9) When practical, a poster shall be fastened and maintained either on or in the cover of each first-aid kit and at or near all phones plainly stating, the phone numbers of available doctors, hospitals, and ambulance services within the district of the worksite.

(10) When required by the department, in addition to the first-aid kit which must be kept on the equipment or at the place of work, there shall be available within the closest practicable distance from the operations (not to exceed one-half mile) the following items:

- 1 set of arm and leg splints.
- 2 all wool blankets or blankets equal in strength and fire resistant (properly protected and marked).
- 1 stretcher.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-545, filed 8/27/81.]

WAC 296-78-550 First-aid station. (1) First-aid stations shall be located as close as practicable to the highest concentration of personnel.

(2) First-aid stations shall be well marked and available to personnel during all working hours.

(3) One person holding a valid first-aid certificate shall be responsible for the proper use and maintenance of the first-aid station.

(4) First-aid stations shall be equipped with a minimum of two first-aid kits, the size of which shall be dependent upon the number of personnel normally employed at the worksite. One first-aid kit may be a permanent wall-mounted kit, but in all cases the station shall be equipped with at least one portable first-aid kit.

(5) When required by the department, the station shall be equipped with two wool blankets and a stretcher in addition to first-aid kits.

(6) A roster, denoting the telephone numbers and addresses of doctors, hospitals and ambulance services available to the worksite, shall be posted at each first-aid station.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-550, filed 8/27/81.]

WAC 296-78-555 First-aid room. (1) Every fixed establishment employing more than two hundred persons shall have a first-aid room plainly designated as such, located as close as possible to the heaviest concentrated work area.

(2) The first-aid room shall be well lighted and ventilated, kept clean and orderly, provided with hot and cold running water, and maintained in a fully-equipped condition.

(3) The first-aid room shall be manned and maintained by:

- (a) A licensed physician; or
- (b) A licensed or registered nurse; or

(c) An employee who:

- (i) Holds a valid advanced first-aid certificate as recognized by the department,
- (ii) works in the vicinity of the first-aid room, and
- (iii) does not perform other work of the nature that is likely to affect adversely her/his ability to administer first-aid.

(4) First-aid rooms shall be equipped with items recommended by the consulting physician or plant medical officer and, as a minimum, should contain an adequate supply of the following:

- Antiseptic soap
- 3/4" or 1" adhesive compresses
- Adhesive knuckle bands
- 2" bandage compresses
- 4" bandage compresses
- 3" x 3" gauze pads
- Assorted sizes of large gauze pads
- 2" roller bandages
- 3" roller bandages
- 4" roller bandages
- Assorted adhesive tape rolls
- Eye dressings
- Ammonia inhalants
- Burn ointment
- Triangular bandages
- Scissors, forceps, razor and blades, medicine droppers
- Safety pins
- Drinking cups
- Rubbing alcohol
- Absorbent cotton
- Arm and leg splints
- Antidotes for specific industrial poisons
- Pressure points chart
- Stretcher
- Wool blankets and clean linen
- Hot water bottles
- Quick colds or ice bag
- Emergency first-aid kit
- A method of sterilizing instruments

(5) A poster shall be maintained on, or in the cover of, each first-aid cabinet and near each first-aid room phone. Such poster will state phone numbers of available doctors, hospitals, and ambulance services within the employer's district.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-555, filed 8/27/81.]

WAC 296-78-560 Safe place standards. (1) Each employer shall furnish to each of his employees a place of employment free from recognized hazards that are causing or likely to cause serious injury or death to his employees.

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

(1999 Ed.)

(3) No employer shall require any employee to go or be in any employment or place of employment which is not safe.

(4) No employer shall fail or neglect:

- (a) To provide and use safety devices and safeguards.
- (b) To adopt and use methods and processes reasonably adequate to render the employment and place of employment safe.
- (c) To do every other thing reasonably necessary to protect the life and safety of employees.

(5) No employer, owner, or lessee of any real property shall construct or cause to be constructed any place of employment that is not safe.

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

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

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

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

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

(e) Intoxicating beverages and narcotics shall not be permitted or used in or around work sites. Workers under the influence of alcohol or narcotics shall not be permitted on the work site. This rule does not apply to persons taking prescription drugs and or narcotics as directed by a physician providing such use shall not endanger the worker or others.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-560, filed 8/27/81.]

WAC 296-78-565 Log dumps and ponds—Headmills.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-565, filed 8/27/81.]

WAC 296-78-56501 Log dumps and ponds. (1) Log dumps, booms, ponds or storage areas, if used at night, shall be illuminated in accordance with the requirements of WAC 296-62-09003, general occupational health standards.

(2) A log dump shall be constructed at each log pond or decking ground. Log trucks shall not be unloaded by use of peavies or by hand.

(a) The roadbed shall be of hard packed gravel, heavy planking or equivalent material and shall be maintained at all times. Roadbeds at log dumps shall be of width and evenness to insure safe operation of equipment.

(b) A mechanical unloading device shall be provided and used for unloading logs. Log unloading areas shall be arranged and maintained to provide a safe working area.

(c) Signs prohibiting unauthorized foot or vehicle traffic in log unloading and storage areas shall be posted.

(d) At no time shall one person be permitted to work alone on a log dump, a booming or rafting grounds, or a log pond.

(3) Water log dumps. Ungrounded electrically powered hoists using handheld remote control in grounded locations, such as log dumps or mill log lifts, shall be actuated by circuits operating at less than 50 volts to ground.

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(4)(a) A brow log, skid timbers or the equivalent shall be installed on all log dumps.

(b) Where logs are unloaded onto skids, sufficient space shall be provided between the top of the skids and the ground to accommodate the body of a person.

(c) All truck dumps shall be built with not more than six inches variation of level from side to side.

(5)(a) All truck log dumps shall be equipped with a positive safeguard to prevent logs from leaving the load on the side opposite the brow log. Jill pokes shall not be used on truck log dumps.

(b) Unloading lines shall be attached and tightened or other positive safeguard in place before binder chains are released at any log dump.

(c) Stakes and chocks which trip shall be constructed in such manner that the tripping mechanism that releases the stake or chocks is activated at the opposite side of the load being tripped.

(d) Binders shall be released only from the side on which the unloader operates, except when released by remote control devices or except when person making release is protected by racks or stanchions or other equivalent means.

(e) Loads on which a binder is fouled by the unloading machine shall have an extra binder or metal band of equal strength placed around the load, or the load shall be otherwise secured so that the fouled binder can be safely removed.

(f) Unloading lines, crotch lines, or equally effective means shall be arranged and used in a manner to minimize the possibility of any log swinging or rolling back.

(6)(a) In unloading operations, the operator of unloading machine shall have an unobstructed view of the vehicle and the logs being unloaded.

(b) Unloading lines shall be arranged so that it is not necessary for the employees to attach them from the pond or dump site of the load except when entire loads are lifted from the log-transporting vehicle.

(7) All log dumps shall be kept reasonably free of bark and other debris.

(8) Employees shall remain in the clear until all moving equipment has come to a complete stop.

(9) Artificial log ponds subject to unhealthy stagnation shall be drained, cleansed, and water changed at least once every six months.

(10) All employees whose regular work requires walking on logs shall wear spiked or calked shoes, except when working in snow.

(11) Employees working on, over or along water, where the danger of drowning exists, shall be provided with and shall wear approved personal flotation devices.

(a) Employees are not considered exposed to the danger of drowning:

(i) When working behind standard height and strength guardrails;

(ii) When working inside operating cabs or stations which eliminate the possibility of accidentally falling into the water;

(iii) When wearing approved safety belts with lifeline attached so as to preclude the possibility of falling into the water;

(iv) When water depth is known to be chest-deep or less.

(b) Prior to and after each use, personal floating devices shall be inspected for defects which would reduce their designed effectiveness. Defective personal flotation devices shall not be used.

(c) To meet the approved criteria required by this subsection (11), a personal flotation device shall be approved by the United States Coast Guard as a Type I PFD, Type II PFD, Type III PFD, or Type V PFD, or their equivalent, pursuant to 46 CFR 160 (Coast Guard lifesaving equipment specifications) and 33 CFR 175.23 (Coast Guard table of devices equivalent to personal flotation devices). Ski belt or inflatable type personal flotation devices are specifically prohibited.

(12)(a) Wooden pike poles shall be of continuous, straight grained No. 1 material. Defective poles, blunt or dull pikes shall not be used.

(b) Aluminum or other metal poles shall not be used where hazard of coming in contact with live electric wires exists.

(13)(a) Walkways and floats shall be provided and security anchored to provide safe passage for workers.

(b) Permanent cable swifters shall be so arranged that it will not be necessary to roll boom sticks in order to attach or detach them.

(c) Inspection of cable or dogging lines shall be made as necessary to determine when repair or removal from service is necessary.

(14)(a) Decks of floats or other walkways shall be kept above the waterline at all times and shall be capable of supporting four times the load to be imposed.

(b) Floating donkeys or other power-driven machinery used on booms shall be placed on a raft or float with enough buoyancy to keep the deck above water.

(15)(a) All regular boom sticks and foot logs shall be reasonably straight, have all protruding knots and bark removed, and shall be capable of supporting above the waterline at either end, any necessary weight of workers and equipment.

(b) Stiff booms shall be two float logs wide secured by boom chains or other connecting devices, and of a width adequate for the working needs. Walking surfaces shall be free of loose material and maintained in good repair.

(c) Boom sticks shall be fastened together with crossties or couplings.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-78-56501, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-56501, filed 8/27/81.]

WAC 296-78-56503 Log hauls. (1) Every log haul used as a walkway shall have at least one walkway with standard railing to enable workers to stand clear of the logs in the chute. Cleats shall be installed to provide safe footing on sloping walkways.

(2) Workers shall not stand under or dangerously near to logs that are being hoisted vertically to the log deck.

(3)(a) Log haul gears and bull chain drive mechanism shall be adequately guarded for the protection of employees.

(b) Log haul bull chains or cable shall be designed, installed, and maintained to provide a 4 to 1 safety factor for the intended load.

(c) Troughs for the return strand of log haul chains shall be provided over passageways.

(d) Overhead protection shall be provided for employees working below logs being moved to the log deck.

(4) Log haul controls shall be arranged to operate from a position where the operator will at all times be in the clear of logs, machinery lines and rigging. Such controls shall operate mechanism only when moved toward the log slip or deck.

(5) Where possible an automatic stop shall be installed on all log hauls. A positive stop shall be installed on all log hauls to prevent logs from traveling too far ahead in the mill.

(6)(a) Slip persons shall handle pike poles in such manner as to be in the clear in case of a slip back.

(b) All sorting gaps shall have a stiff boom on each side.

(c) The banks of the log pond in the vicinity of the log haul shall be reinforced to prevent caving in.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-56503, filed 8/27/81.]

WAC 296-78-56505 Boats and mechanical devices on waters. (1) The applicable provisions of the Standard for Fire Protection for Motorcraft, NFPA No. 302-1994, shall be complied with. Prior to starting the boat motor, any spilled fuel shall be removed and vapors shall be exhausted from any area in which they may accumulate.

(2) The bilge area shall be kept clean and oil, grease, fuel, or highly combustible materials shall not be allowed to accumulate.

(3) Adequate ventilation equipment shall be provided and used for the bilge area to prevent the accumulation of toxic or explosive gases or vapors.

(4) Adequate ventilation equipment shall be provided and used for the cabin area on enclosed cabin-type boats to prevent an accumulation of harmful gases or vapors.

(5) Deck and cabin lighting shall be provided and used where necessary to provide safe levels of illumination aboard boats. Boats operated during the period from sunset to sunrise, or in conditions of restricted visibility, shall display navigation lights as required by the United States Coast Guard. Searchlights or floodlights shall be provided to facilitate safe navigation and to illuminate working or boarding areas adjacent to the craft.

(6) Decks of pond boats shall be covered with nonslip material. On craft used by workers wearing calked shoes, all areas where the operator or workers must stand or walk shall be made of or be covered with wood or other suitable matting or nonslip material and such covering shall be maintained in good condition.

(7) Each boat shall be provided with a fire extinguisher and life ring with at least fifty feet of one-fourth inch line attached. On log broncs, boom-scooters, or other small boomboats where all occupants are required to wear life saving devices and a life ring would present a tripping hazard, the life ring may be omitted.

(8)(a) Along docks, walkways, or other fixed installations on or adjacent to open water more than five feet deep, approved life rings with at least ninety feet of one-fourth inch line attached, shall be provided. The life rings shall be spaced at intervals not to exceed two hundred feet and shall be kept in easily visible and readily accessible locations.

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(b) When employees are assigned work at other casual locations where exposure to drowning exists, at least one approved life ring with at least ninety feet of line attached, shall be provided in the immediate vicinity of the work assigned.

(c) When work is assigned over water where the vertical drop from the accidental fall would exceed fifty feet, special arrangements shall be made with and approved by the department of labor and industries prior to such assignment.

(d) Lines attached to life rings on fixed locations shall be at least ninety feet in length, at least one-fourth inch in diameter, and have a minimum breaking strength of five hundred pounds. Similar lines attached to life rings on boats shall be at least fifty feet in length.

(e) Life rings must be United States Coast Guard approved thirty-inch size.

(f) Life rings and attached lines shall be maintained to retain at least seventy-five percent of their designed buoyancy and strength.

(g) Log broncs, boomscooters, and boomboats shall not be loaded with personnel or equipment so as to adversely affect their stability or seaworthiness.

(h) Boats shall not be operated at an excessive speed or handled recklessly.

(i) Boat fuel shall be transported and stored in approved containers. Refer to WAC 296-24-58501(19) for definition of approved.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-56505, filed 8/20/96, effective 10/15/96; 88-23-054 (Order 88-25), § 296-78-56505, filed 11/14/88. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-56505, filed 8/27/81.]

WAC 296-78-56507 Log decks. (1) Dry deck storage.

(a) Dry deck storage areas shall be kept orderly and shall be maintained in a condition which is conducive to safe operation of mobile equipment.

(b) Logs shall be stored in stabilized piles, and roadways and traffic lanes shall be maintained at a width adequate for safe travel of log handling equipment.

(c) Logs shall be arranged to minimize the chance of accidentally rolling from the deck.

(2)(a) Employees shall not spool cable on winch or drums with their hands.

(b) Log wells shall be provided with safeguard to prevent logs from rolling back into well off log deck.

(3) Jump skids on log decks shall be installed in grooves in a manner that they cannot work out onto the carriage way.

(4)(a) Log decks shall be provided with effective means to prevent logs from accidentally rolling down the deck onto the carriage or its runway.

(b) Swing saws. Swing saws on log decks shall be equipped with a barricade and stops for protection of employees who may be on the opposite side of the log haul chute.

(c) Drag saws. Where reciprocating log cutoff saws (drag saws) are provided, they shall not project into walkway or aisle.

(d) Circular cutoff saws. Circular log bucking or cutoff saws shall be so located and guarded as to allow safe entrance to and exit from the building.

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(e) Entrance doorway. Where the cutoff saw partially blocks the entrance from the log haul runway the entrance shall be guarded.

(5) A barricade or other positive stop shall be erected between the sawyer's stand and the log deck to protect the sawyer from rolling logs. Such barricade or stop shall be of sufficient strength to stop any log.

(6) Chains from overhead canting gear or other equipment shall not be allowed to hang over the log deck in such manner as to endanger workers.

(7) Canting gear control levers shall be so arranged that they move away from the carriage to operate.

(8) Moving parts or equipment on or about log decks shall be guarded.

(9) Peavies, canthooks and other hand tools shall be kept in good repair at all times.

(10) Workers shall not go below logs on decks that are likely to roll or be rolled. Means of access shall be provided to the head rig which does not subject employees to the hazard of moving logs or equipment.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-56507, filed 8/27/81.]

WAC 296-78-56509 Mechanical barkers. (1) Rotary barkers. Rotary barking devices shall be so guarded as to protect employees from flying chips, bark, or other extraneous material.

(2) Elevating ramp. If an elevating ramp or gate is used, it shall be provided with a safety chain, hook, or other means of suspension while employees are underneath.

(3) Area around barkers. The hazardous area around ring barkers and their conveyors shall be fenced off or posted as a prohibited area for unauthorized persons.

(4) Enclosing hydraulic barkers. Hydraulic barkers shall be enclosed with strong baffles at the inlet and outlet. The operator shall be protected by adequate safety glass or equivalent.

(5) Holddown rolls. Holddown rolls shall be installed at the infeed and outfeed sections of mechanical ring barkers to control the movement of logs.

(6) If such holddown rolls have a tendency to throw logs or chunks, horseshoe or equivalent type guards shall be installed to contain the logs or chunks.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-56509, filed 8/27/81.]

WAC 296-78-56511 Head rigs and feed works. (1) A clear walkway shall be provided along the upper side of the log deck and around the head rig unless an overhead walkway is provided.

(2) The sawyer shall be primarily responsible for the safety of the carriage crew and off-bearers. He shall exercise due care in the operation of the carriage and log turning devices.

(3) Feedworks and log turning control levers shall be so arranged that they may be securely locked when not in use and shall be guarded against accidental contact.

(4)(a) A positive means shall be provided to prevent unintended movement of the carriage. This shall involve a control locking device, a carriage tie-down, or both.

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(b) An emergency control or equally effective means shall be provided so that the sawyer may stop the head rig section of the mill without leaving the operator station.

(5) An effective method of disengaging the head rig saws from the power unit shall be installed on all head rigs where the power unit is not directly controlled by the sawyer. The saws shall be disengaged from the source of power while repairs or changes are made.

(6) A shield of lexan, makrolon, merlon, plestar, or equivalent transparent material, shall be installed between the sawyer's stand and the head saws in all circular mills. In band mills and chipper type installations, a wire screen of not less than twelve gauge wire, one-half inch mesh, mounted in a frame in compliance with the requirements of WAC 296-24-20531 of the general safety and health standards, is an acceptable substitute for the type shield required in circular mills.

(7) Safety glasses, safety shields or other suitable eye protection shall be provided for and use by head rig off-bearers.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-56511, filed 8/27/81.]

WAC 296-78-56513 Log carriages. (1) Carriages upon which employees are required to work shall be solidly decked over.

(2) Dogs. Dogging devices shall be adequate to secure logs, cants, or boards, during sawing operations.

(3) The feed control lever of friction or belt driven carriage feed works shall be arranged to operate away from the saws or carriage track.

(4) A quick action valve, controlled from the sawyer's stand, shall be located in the steam line to any steam operated feed works. The valve shall be tested daily.

(5) Valves in steam feeds shall be closed and locked in a neutral position before the sawyer leaves his station. Leaking steam valves or piping shall not be used on carriage drives.

(6)(a) Where employees ride the headrig carriage, clearance of the rear edge of the carriage shall be either not more than two inches or shall be not less than thirty inches from the side wall of the building. The side wall shall be boarded over smoothly to height of not less than six feet six inches from the setter's platform and for at least the length of the carriage travel. Where the clearance is thirty inches or more the floor between the back side of the setter's platform and the wall shall be raised to the level of the platform. The clearance between the floor edge and the platform shall not be more than two inches.

(b) Barriers and warning signs. A barrier shall be provided to prevent employees from entering the space necessary for travel of the carriage, with headblocks fully retracted, for the full length and extreme ends of carriage runways. Warning signs shall be posted at possible entry points to this area.

(7) Safe access to the head rig shall be provided.

(8) No roof truss or roof timber or other obstruction shall be located within six feet six inches of the upper surface of the setter's platform on any carriage.

(9) Doors which lead onto a passageway at the end or side of the carriage runway shall be provided with a handrail opposite such doorway. Handrail shall not be less than eight

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teen inches from the carriage run. A warning sign shall be posted on the entrance side of such doorways.

(10) A stop or bumper capable of stopping the loaded carriage at operating speed shall be installed at each end of the carriage run.

(11) Rail sweeps shall be installed in front of the front wheels in the direction of travel. Such sweeps shall extend to within one-fourth inch of the rail.

(12) Where power operated log turners are used, carriage knees shall be provided with goosenecks or other means of protecting the carriage crew from climbing logs.

(13) Employees shall use a stick or wire brush to clear head blocks of debris.

(14) All weakened or broken carriage boards which will not support the load to be imposed with a safety factor of 4, shall be immediately replaced.

(15) Carriage control. A positive means shall be provided to prevent unintended movement of the carriage. This may involve a control locking device, a carriage tie-down, or both.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-56513, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-56513, filed 8/27/81.]

WAC 296-78-570 Band saws—Saws. (1) Band head rigs shall be given a thorough daily inspection and any deficiency reported and corrected.

(2) Any band saw found to have developed a crack greater than one-tenth the width of the saw shall be removed from service until the width of the saw is reduced to eliminate the crack, the cracked section is removed, or the development of the crack is arrested by welding.

(3) Band saws shall not be continued in use of the head rig for which they have been designed after they have been reduced forty percent in width.

(4) Leather gloves, or equivalent hand protection, shall be worn by employees while changing band saws.

(5) All head band saw wheels shall have a minimum rim thickness of five-eighths inch, except for a distance of not to exceed one inch from the front edge of the wheel.

(6) Provisions shall be made for alerting and warning employees before starting band head saws, and measures shall be taken to insure that all persons are in the clear.

(7) No band saw shall be run at a peripheral speed in excess of that recommended by the manufacturer. The manufacturer's recommended maximum speed shall be stamped in plainly legible figures on some portion of the assembly.

(8) A band wheel that has developed a crack in the rim shall be immediately removed from service. If a crack has developed in a spoke the wheel shall be removed from service until repaired.

(9) All band wheels shall be completely encased or guarded on both sides. The exposed part of the saw blade on the uptravel between the two wheels shall be encased, and no portion of the blade exposed, except such part of the cutting edge as is essential for sawing the material at hand.

(10) All band wheel guards shall be constructed of not less than ten U.S. gauge metal, or not less than two inch wood material or equivalent, attached to the frames. Ventilating ports shall not exceed 2 x 4 inches in size. Openings necessary for lubrication or repair of the saw shall have doors or

gates of equivalent strength to the remainder of the guard, and such doors or gates shall be securely closed during operation.

(11) Every band mill shall be equipped with a saw catcher, rest or guard of substantial construction.

(12) All band saws other than head mills shall be enclosed or guarded except the working side of the blade between the guide and the table. The guard for the portion of the saw between the sliding guide and the upper saw wheel guard shall be adjusted with the guide.

(13) Each gang ripper of band or straight saw type shall have the cutting edges of the saw guarded by a hood or screen secured to the framework of the machine.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-570, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-570, filed 8/27/81.]

WAC 296-78-575 Circular saws. (1) Single circular head saws. Circular head saws shall not be operated at speeds in excess of those specified by the manufacturer. Maximum speed shall be etched on the saw.

(2) On all circular saw mills the horizontal distance from the side of the saw to the nearest post of the husk or frame shall be at least one inch greater than the clear vertical distance between the collars of the top and bottom saws.

(3) Circular head saws shall be equipped with safety guides that can be readily adjusted without use of wrench or other hand tools. Brackets or edging supports shall be installed between the saw and the side of the husk.

(4) The upper saw of a double circular mill shall be provided with a hood or guard. A screen or other suitable device shall be placed so as to protect the sawyer from flying particles.

(5) All circular sawmills where live rolls are not used behind the head saw shall be equipped with an effective spreader or splitter. In any mill where the head saw is used for edging lumber, the splitter shall be solid and stationary and shall extend above the head blocks.

(6) Drag saws or circular cut-off saws shall be so arranged that they will not project into any passageway. When existing installations do not leave clear passage, saws shall be fenced off in order to make it impossible for anyone to walk into them. Means to securely hold material being sawed shall be provided wherever such material creates a hazard.

(7) All employees shall be in the clear before starting operation of drag or swing cut-off saws.

(8) Twin circular head saws. Twin circular head saw rigs such as scrag saws, shall meet the specifications for single circular head saws in subsection (1) of this section, where applicable.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-575, filed 8/27/81.]

WAC 296-78-580 Edgers. (1) Edgers shall be guarded by a metal housing of ten gauge sheet metal, ten gauge by one-half inch mesh wire, screen, or by a baffle of not less than two inch wood material.

(2) Openings in end frames shall be enclosed with sheet metal, wire screen or wood and may be hinged or arranged to permit oiling and removal of saws.

(3) The top of the edger shall be guarded to prevent contact by employees or debris being thrown and all chains and gears fully enclosed as required by WAC 296-78-710 of this chapter.

(4) Vertical arbor edgers installed ahead of the main saw shall be so located and guarded that an employee cannot contact any part of the edger saws from his normal operating position.

(5) Edgers shall not be located in the main roll case behind the head saw.

(6) All edgers shall be equipped with pressure feed rolls. The controls shall be installed and located so that from the normal work station the operator can quickly stop the infeed drive without releasing the hold down tension of the pressure rolls.

(7) All edgers shall be provided with a method of preventing or guarding against kickbacks. Finger units or dogs installed at the edger, or hinged steel plates suspended across the feed table may be used for this purpose. A kickback barricade, in line with the edger, if fenced off may be used.

(8) Pressure and feed rolls on edgers shall be guarded against accidental contact by means of roll covers, bars or strips. The pressure rolls shall not be lifted while stock is being run, or while any person is in line with the feed side of the saws.

(9) Edger men shall not raise feed rolls and reach between saws while edger is in operation.

(10) Edger men shall not put hands on cants being run through the edger.

(11) Live rolls and rotating powered tailing devices in back of edger shall operate at a speed not less than the speed of the edger feed rolls.

(12) Tables in back of edgers shall be kept clear of cants, edgings and unnecessary debris.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-580, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-580, filed 8/27/81.]

WAC 296-78-585 Equalizer saws. (1) Equalizer saws for bolts, staves, heading, etc., shall have the saws encased, except that portion immediately adjacent to the feeding device.

(2) Feeding devices on all such equipment shall be provided with guards to prevent contact with the feeding device by employees.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-585, filed 8/27/81.]

WAC 296-78-590 Gang saws and re-saws. (1) Gang saws and re-saws shall be fully guarded or housed in accordance with conditions. Cranks, pitman rods, and other moving parts shall be guarded.

(2) Feed rolls shall be enclosed by a cover over the top, front, and open ends except where guarded by location. Drive mechanism to feed rolls shall be enclosed.

(3) Feed rolls shall be enclosed and if the operator stands within thirty inches of the feed rolls, they shall be so guarded as to prevent operator coming into contact with them.

(4) Circular re-saws or rip saws, except power feed rip saws with a roller or wheel back of the saw, shall be provided with splitters or spreaders.

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(5) A hood of metal or wood of sufficient strength to give protection against splinters or flying teeth shall be provided over all circular rip saws.

(6) That portion of the saw extending below the table shall be so guarded as to prevent contact.

(7) Circular rip saws shall be equipped with a standard anti-kickback device.

(8) Carriage cradles of whole-log sash gang saws, Swedish gangs shall be of height to prevent logs from kicking out while being loaded.

(9) Band re-saws. Band re-saws shall meet the specifications for band head saws as required in WAC 296-78-570(7).

(10) Circular gang re-saws.

(a) Banks of circular gang re-saws shall be guarded by a hood to contain teeth or debris which can be thrown by the saws.

(b) Circular gang re-saws shall be provided with safety fingers or other anti-kickback devices.

(c) Circular gang re-saws shall not be operated at speeds exceeding those recommended by the manufacturer.

(d) Feed belts and drive pulleys shall be guarded in accordance with the requirements of WAC 296-24-205 through 296-24-20533 of the general safety and health standard.

(e) Each circular gang re-saw, except self-feed saws with a live roll or wheel at back of saw, shall be provided with spreaders.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-590, filed 8/27/81.]

WAC 296-78-595 Jump saws. (1) Jump saws shall have guards below the top of the table or roll case. A guard shall be placed over the roll casing to prevent persons from walking into or over the saw.

(2) Jump saws, underhung swing saws, or bed trimmers shall be so arranged that the saws are fully enclosed when not in actual use.

(3) A positive stop shall be installed to prevent the saw from passing the front edge of the roll case or table. The throat in the table or roll case shall be only wide enough to permit unobstructed operation of the saw.

(4) Guards constructed of not less than two inch wood material or of heavy wire mesh mounted in a steel frame shall be placed in front of jump saw trimmers. Stops shall be installed to prevent timber from being thrown off the roll case.

(5) Foot treadle operated saws shall be provided with safeguards to prevent accidental contact.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-595, filed 8/27/81.]

WAC 296-78-600 Trimmer and slasher saws. (1) Trimmer of [and] slasher saws shall be guarded in front by a flat or round steel framework with a rigid metal screen or light iron bars attached thereto, or by wood baffles of not less than two inch wood material securely bolted to the frame.

Maximum speed. Trimmer saws shall not be run at peripheral speeds in excess of those recommended by the manufacturer.

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(2) Front guards for a series of saws shall be set as close to the top of the feed table as is practical when considering the type of machine in use and the material being cut. The end saws of a series shall be guarded or fenced off.

(3) The rear of a series of saws shall have a stationary or swinging guard of not less than two inch wood material or equivalent the full width of the saws and as much wider as is necessary to protect persons at the rear of the trimmer.

(4) Safety stops. Automatic trimmer saws shall be provided with safety stops or hangers to prevent saws from dropping on table.

(5) Feed chains shall be stopped while employees are on the feed table.

(6) Spotters for trimmers or slashers shall be provided with goggles or other eye protection when conditions so warrant.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-600, filed 8/27/81.]

WAC 296-78-605 Swing saws. (1) Manually operated swing cut-off saws of the following types shall be set up, guarded and operated in accordance with WAC 296-24-16515, general safety and health standards:

- Saws into which materials to be cut are fed or positioned and/or held in position by hand pressure during the cutting stroke; and/or

- Saws on which the cutting stroke is propelled by hand pressure; and/or

- Saws on which the operator is within arm's reach of the blade when the operator is standing at the operator's control station and the blade is fully extended to the limit of operating travel.

(2) Operators of hand operated swing saws shall not stand directly in front of saw while making a cut.

(3) Swing cut-off saws which are fed by powered live rolls, conveyor chains and/or belts and which are operated from a remote operator's station (defined as being beyond arm's reach of the blade when the blade is fully extended to the limit of operating travel) shall be set up, guarded and operated in accordance with the following:

(a) Overhead swing cut-off saws shall be guarded by a hood which shall cover the upper half of the cutting edge at least to the depth of the teeth.

(b) The driving belts on overhead swing cut-off saws, where exposed to contact, shall be provided with guards as required by WAC 296-78-71505.

(c) Saws shall be completely enclosed when in idle position.

(d) Power operated swing saws shall have controls so arranged that the operators will not stand directly in front of saw when making cut.

(e) All swing saws shall be equipped with a counter balance which shall be permanently fastened to the frame of the saw and so arranged or adjusted that it will return the saw beyond the rear edge of the table or roll case without a rebounding motion. Wire rope, chain or nonmetallic rope running to a weight over a sheave shall not be used for attaching counter balance.

(f) No swing cut-off or trim saw shall be located directly in line with stock coming from an edger.

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(g) Swing limit stops shall be provided and so adjusted that at no time shall the forward swing of the saw extend the cutting edge of the saw beyond a line perpendicular with the edge of the saw table, roll case, guard or barrier.

(h) Saws that are fed into the cut by means of air, steam, hydraulic cylinders, or other power device or arrangement shall be designed so they can be locked or rendered inoperative.

(i) Foot treadle operated saws shall be provided with safeguards to prevent accidental contact.

(j) Swing saws on log decks shall be equipped with a positive stop for the protection of persons who may be on the opposite side of the log haul chute.

(k) Tables or roll casings for swing saws shall be provided with stops or lineup rail to prevent material being pushed off on opposite side.

(4) Operators of hand operated swing saws shall not stand directly in front of saw while making cut.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-605, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-605, filed 8/27/81.]

WAC 296-78-610 Circular saws, speeds, repairs. (1) Circular saws shall not be operated at speeds in excess of that specified by the manufacturer. Speeds shall be etched on all new saws. When saws are repaired, remanufactured or retensioned in any way to change their operating speeds, such change of speed shall be etched on the saw. These etched speeds shall not be exceeded.

(2) Circular saws shall be inspected for cracks each time that the teeth are filed or set.

(3) A circular saw shall be discontinued from use until properly repaired when found to have developed a crack equal to the length indicated in the following table:

<u>Length of Crack</u>	<u>Diameter</u>
1/2 -inch	Up to 12"
1 -inch	Over 12" to 24"
1-1/2 -inch	Over 24" to 36"
2 -inch	Over 36" to 48"
2-1/2 -inch	Over 48" to 60"
3 -inch	Over 60"

(4) Welding or slotting of cracked saws shall be done by a sawsmith under a procedure recommended by the saw manufacturer. Holes shall not be drilled in saws as a means of arresting cracks. After saws are repaired they shall be retensioned. Unless a sawsmith is employed, saws shall be returned to the manufacturer for welding or tensioning.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-610, filed 8/27/81.]

WAC 296-78-615 Saw filing and grinding rooms and equipment. (1) Approaches to filing rooms shall be kept free from material and equipment at all times.

(2) Enclosed grinding and filing rooms shall be ventilated as specified in the general occupational health standard, WAC 296-62-110 through 296-62-11019.

(3) Each filing and grinding room shall be provided with two exits so arranged as to permit easy escape in case of fire.

(4) Floor shall be cleaned regularly and shall be kept free from oil, grease and other materials that might cause employees to slip or fall.

(5) Flooring around machines shall be kept in good repair at all times.

(6) Saw grinding machine belts shall be provided with guards where these belts pass through the frame of the machine.

(7) All grinding wheels on such machines shall be provided with a metal retaining hood which shall also cover the arbor ends if they are exposed to contact.

(8) Filing room employees shall be provided with goggles, face shields, or other necessary protective equipment and are required to wear the same.

(9) Guarding and mounting of abrasive wheels shall be in accordance with WAC 296-24-18003 through 296-24-18007 of the general safety and health standards.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-18-029 (Order 81-21), § 296-78-615, filed 8/27/81.]

WAC 296-78-620 Miscellaneous woodworking machines—Planers, stickers, molders, matchers. (1) Each planing, molding, sticking and matching machine shall have all cutting heads, and saws if used, covered by a solid metal guard. If such guard is constructed of sheet metal, the material used shall be not less than one-sixteenth inch in thickness, and if cast iron is used, it shall be not less than three-sixteenths inch in thickness.

(2) Planers, stickers, molding, sticking and matching machines shall be provided with exhaust fans, hoods and dust conveyors to remove the harmful dusts, etc., from the vicinity of the operator. Such hoods may be arranged to serve as guards for cutting heads.

(3) Planers and other machinery or equipment shall not be oiled while in motion, unless provided with guards or other devices to permit oiling without any possibility of contact with moving parts of machinery.

(4) Feed rolls shall be guarded by means of roll covers, bars or strips, attached to the roll frame in such manner as to remain in adjustment for any thickness of lumber.

(5)(a) Levers or controls shall be so arranged or guarded as to prevent accidental operation of machines.

(b) Foot treadle operated machines shall have a treadle guard fastened over the treadle.

(c) Locks, blocks, or other device shall be provided for positive immobilization of machine controls while repairs or adjustments are being made.

(6) Side head hoods shall be of sufficient height to safeguard the head set screw.

(7) Side heads shall not be adjusted while machine is in operation, except when extension adjusting devices are provided.

(8) Side belt and pulley guards shall be kept in place at all times the machine is in motion.

(9) All universal joints shall be enclosed.

[Statutory Authority: Chapter 49.17 RCW, 96-17-056, § 296-78-620, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-18-029 (Order 81-21), § 296-78-620, filed 8/27/81.]

WAC 296-78-625 Planers (stave and headings). (1) Each planer (stave and heading) shall have all cutting heads, and saws if used, covered by a solid metal guard.

(2) Stave and heading planers shall be provided with exhaust fans, hoods and dust conveyors to remove the harm-

ful dusts, etc., from the vicinity of the operator. Such hoods may be arranged to serve as guards for cutting heads.

(3) Sectional feed rolls should be provided. Where solid feed rolls are used, a sectional finger device (or other means equally effective) shall be provided to prevent kickbacks.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-18-029 (Order 81-21), § 296-78-625, filed 8/27/81.]

WAC 296-78-630 Stave croziers. (1) Stave croziers shall have the heads guarded completely by the exhaust hood or other device, except that portion which actually inbeds itself in the stock.

(2) Each stave crozier shall have all feed chains and sprockets completely enclosed.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-18-029 (Order 81-21), § 296-78-630, filed 8/27/81.]

WAC 296-78-635 Jointers. (1) Each hand feed jointer or buzz planer with horizontal head shall be provided with an automatic guard over the cutting head both in front of and in back of the guide.

(2) Each jointer or buzz planer with horizontal head shall be equipped with a cylindrical cutting head, the throat of which shall not exceed three-eighths inch in depth or one-half inch in width. The knife projection shall not exceed one-eighth inch beyond the cylindrical body of the head.

(3) The opening in the table shall be kept as small as possible. The clearance between the edge of the rear table and the cutter head shall be not more than one-eighth inch. The table throat opening shall be not more than two and one-half inches when tables are set or aligned with each other for zero cut.

(4) Each jointer or buzz planer with vertical head shall be guarded by an exhaust hood or other approved device which shall completely enclose the revolving head except for a slot sufficiently wide to permit the application of material. The guard shall effectively protect the operator's hand from coming in contact with the revolving knives. The guard shall automatically adjust itself to cover the unused portion of the head and shall remain in contact with the material at all times.

(5) Push sticks shall be provided and used for feeding stock through hand operated jointers or buzz planers.

[Statutory Authority: Chapter 49.17 RCW, 96-17-056, § 296-78-635, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-18-029 (Order 81-21), § 296-78-635, filed 8/27/81.]

WAC 296-78-640 Jointers (stave and heading). (1) Stave and heading jointers and matchers shall have the heads guarded completely by the exhaust hood or other device, except that portion where the stock is applied.

(2) Foot power stave jointing machines shall have the knife effectively guarded to prevent the operator's fingers from coming in contact with it.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-18-029 (Order 81-21), § 296-78-640, filed 8/27/81.]

WAC 296-78-645 Wood shapers. (1) The cutting head of each wood shaper, hand feed panel raiser, or other similar machine not automatically fed, shall be guarded with a cage or pulley guard or other device so designed as to keep the operator's hands away from the cutting edge. In no case shall a warning device of leather or other material attached to the

spindle be acceptable. Cylindrical heads shall be used whenever the nature of the work permits. The diameter of circular shaper guards shall be not less than the greatest diameter of the cutter.

(2) All double spindle shapers shall be provided with a spindle starting and stopping device for each spindle or provision shall be made that only one spindle operate at any one time.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-645, filed 8/27/81.]

WAC 296-78-650 Boring and mortising machines. (1) Boring and mortising machines shall be provided with safety bit chucks without projecting set screws. Automatic machines shall be provided with point of operation guards. When necessary to prevent material from revolving with the bit, clamps or stops shall be provided and used to hold material firmly against the guides.

(2) The requirements of WAC 296-24-16525, general safety and health standards, shall be applicable to boring and mortising machines.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-650, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-650, filed 8/27/81.]

WAC 296-78-655 Tenoning machines. (1) Each tenoning machine shall have all cutting heads, saws if used, and all exposed moving parts guarded. In the case of cutting heads and saws, the guard shall be of solid metal.

(2) If sheet metal is used, it shall be not less than ten U.S. gauge in thickness. If cast metal is used it shall be not less than three-sixteenths inch thick, or if aluminum is used, it shall be not less than five-eighths inch thick. The hood of the exhaust system may form part or all of the guard. When so used, the hood shall be constructed of metal of a thickness not less than that specified herein.

(3) Feed chains and sprockets of all double end tenoning machines shall be completely enclosed, except that portion of chain used for conveying stock. At rear ends of frames over which the feed conveyors run, sprockets and chains shall be guarded at the sides by plates projecting beyond the periphery of sprockets and ends of lugs.

(4) The rear end of the frame over which the feed conveyors run shall be so extended that the material as it leaves the machine will be guided to a point within easy reach of the person removing stock at the rear of the tenoner.

(5) Single end tenoners, hand fed, shall have a piece of sheet metal placed so that the operator's hands cannot slip off the lever handle into the tool in passing. Such guard shall be fastened to the lever.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-655, filed 8/27/81.]

WAC 296-78-660 Lathe (pail and barrel). (1) Each profile, swing-head and back-knife lathe shall have all cutting heads covered by a solid metal guard.

(2) If sheet metal is used, it shall be not less than ten U.S. gauge in thickness. If cast metal is used, it shall be not less than three-sixteenths inch thick, or if aluminum is used, it shall be not less than five-eighths inch thick. The hood of the exhaust system may form part or all of the guard. When so

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used, the hood shall be constructed of metal of a thickness not less than that specified above.

(3) Pail and barrel lathes shall be guarded in accordance with the specifications for profile and back-knife lathes insofar as they are applicable.

(4) The requirements of WAC 296-24-16531, general safety and health standards, shall be applicable to pail and barrel lathes.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-660, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-660, filed 8/27/81.]

WAC 296-78-665 Sanding machines. (1) Each belt sanding machine shall have both pulleys enclosed in such a manner as to guard the points where the belt runs onto the pulleys. The edges of the unused run of belt shall be enclosed or otherwise guarded from contact by employees.

(2) Each drum sanding machine shall be provided with a guard so arranged as to completely enclose the revolving drum except such portion required for the application of the material to be finished. Guards with hinges to facilitate the insertion of sandpaper may be installed. The exhaust hood may form part or all of this guard. When so used, the hood shall conform to the specifications as given under exhaust systems in WAC 296-78-710.

(3) All standard stationary sanding machines shall be provided with exhaust systems in conformity with the section of this code dealing with exhaust systems.

(4) All portable sanding machines shall be provided with means of removing excessive dust, or employees using equipment shall be provided with such necessary respiratory protective equipment as will conform to the requirements of the general occupational health standards, chapter 296-62 WAC.

(5) The requirements of WAC 296-24-16533, general safety and health standards, shall be applicable to sanding machines.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-665, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-665, filed 8/27/81.]

WAC 296-78-670 Glue machines. (1) Personal protective equipment as required by the general safety and health standard, chapter 296-24 WAC, Part A-2, and the general occupational health standard, WAC 296-62-11021, and proper washing facilities with noncaustic soap and sterilizers, shall be provided for all employees handling glue. Rubber gloves and other personal equipment must be sterilized when transferred from one person to another.

(2) Glue spreaders shall be enclosed on the in-running side, leaving only sufficient space to insert the stock.

(3) All glue spreaders shall be equipped with a panic bar or equivalent type device that can be reached from either the infeed or outfeed side of the spreader to shut-off the power in an emergency situation. Such device shall be installed on existing glue spreaders no later than April 1, 1982, and be standard equipment on any glue spreader purchased after January 1, 1982.

(4) All glue mixing and handling rooms where located above work areas shall have water tight floors.

(5) All glue rooms shall be provided with ventilation in accordance with WAC 296-62-110 through 296-62-11013, of the general occupational health standard.

[Statutory Authority: Chapter 49.17 RCW. 94-20-057 (Order 94-16), § 296-78-670, filed 9/30/94, effective 11/20/94. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-670, filed 8/27/81.]

WAC 296-78-675 Lath mills. (1) Lath mills shall be so arranged that stock pickers shall be protected from slabs and blocks from slasher and trimmers.

(2) Bolters and lath machines shall be provided with a wall or shield of not less than two inch wood material or equivalent, constructed in front of the machines, to protect stock pickers and passing employees from kickbacks.

(3) Lath bolters and lath mills shall have all feed rolls, belts, gears and moving parts provided with approved guards. Feed chains shall be guarded to as low a point as the maximum height of the stock will permit.

(4)(a) Lath bolters and lath mill saws shall be provided with a sheet metal guard not less than one-eighth inch thick, or a cast iron guard not less than three-sixteenths inch thick, or equivalent. These hoods may be hinged so that they can be turned back to permit changing of the saws.

(b) A metal plate baffle, finger device or other device, shall be installed to prevent kickbacks.

(5)(a) The feed rolls on bolters or lath mills shall not be raised while any employee is in line with the saws.

(b) The stock shall be pushed through the saws with another piece of stock or push stick.

(6)(a) The lath trimmer shall be provided with guards on the ends, the top and the rear so designed as to contain debris and prevent employee contact with the saw. The belt drive shall be provided with guards as required by WAC 296-78-710.

(b) The entire top half of all trimmer saws shall be provided with guards. The guards shall be so adjusted as to prevent employees from accidentally contacting saws.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-675, filed 8/27/81.]

WAC 296-78-680 Veneer and plywood plants—Peeling and barking. (1) Where peeling or barking pits are located directly under the log cranes, logs shall not be moved over workers.

(2) Single spiked hooks without a bell shall not be used for handling logs. Hooks shall be equipped with hand holds and shall be maintained in condition to safely perform the job application.

(3) Mechanical barking devices shall be so guarded as to protect employees from flying chips, bark or other matter.

(4) Logs shall not be removed from barker until barking head has ceased to revolve, unless barker is so designed and arranged that barking head will not create or constitute a hazard to employees.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-680, filed 8/27/81.]

WAC 296-78-685 Veneer lathe. (1) The elevating ramp (gate) shall be provided with a safety chain and hook or other

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positive means of suspension while employees are working underneath same.

(2) The area under the tipple from lathe to stock trays shall be provided with railings or other suitable means of preventing employees from entering this area, if access is not prevented by the construction of the machine and employees can enter this area.

(3) Catwalks shall be provided along stock trays so that employees will not have to climb on the sides of trays to straighten stock.

(4) Any section of stock trays shall be locked out or shall have an operator stationed at starting controls while stock is being removed or adjusted.

(5) Guards which will cover the cutting edge of veneer lathe and clipper blades shall be provided and used while such blades are being transported about premises.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-685, filed 8/27/81.]

WAC 296-78-690 Veneer slicer and cutter. (1) Each veneer slicer and each rotary veneer cutter shall have all revolving and other moving knives provided with guards.

(2) The requirements of WAC 296-24-16535, general safety and health standards, shall be applicable to veneer slicers and cutters.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-690, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-690, filed 8/27/81.]

WAC 296-78-695 Veneer clipper. (1) Each veneer clipper shall have either automatic feed or shall be provided with a guard which will make it impossible to place any portion of the hand under the knife while feeding stock. Where practicable, such guard shall be of the vertical finger type.

(2) The rear of each manually operated clipper shall be guarded either by a screen or vertical finger guard which shall make it impossible for any portion of the hand to be placed under the knife while removing clipped stock.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-695, filed 8/27/81.]

WAC 296-78-700 Veneer wringer (swede). The entry side of each veneer wringer other than glue spreader shall be enclosed, leaving only sufficient space to insert stock. A guard shall be provided to prevent the veneer from overriding the top roll and kicking back.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-700, filed 8/27/81.]

WAC 296-78-705 The shake and shingle industry. The following terms and standards shall apply only in the manufacturing of shakes and shingles and these requirements shall take precedence over other sawmill and woodworking standards.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-705, filed 8/27/81.]

WAC 296-78-70501 Definitions—Terms, general. (1) "Block(s)" - those sections of a log cut in various lengths.

(2) "Block(s)" and "bolt(s)" may be considered to be synonymous.

(3) "Clipper saw" - a circular saw used to trim manufactured shingles.

(4) "Groover" - a cylinder-type knife (knives) similar to a planer knife (knives), used to cut grooves into the face surface of shakes or shingles.

(5) "Hip" and "ridge saw" - a circular saw used to cut various angles on the side edge of shakes or shingles.

(6) "Johnson bar" - a shaft used to control the feed of the carriage.

(7) "Knee bolter circular saw" - a stationary circular saw used to trim and debark blocks (the blocks are manually maneuvered onto a carriage and fed into a saw).

(8) "Log haul" - a power conveyor used to move logs to mill.

(9) "Packers" - employees who pack the manufactured shakes or shingles into bundles.

(10) "Panagraph power splitter" - a hydraulically operated wedge, manually positioned into place, used to split blocks.

(11) "Power saw splitter" - a stationary circular saw used to split (saw) blocks, (the blocks are manually maneuvered onto a carriage and fed into the saw).

(12) "Set works" - a component of the shingle machine, located on the machine frame, used to control the thickness of each shingle being manufactured.

(13) "Shake machine" - a band saw used to cut shake blanks into manufactured shakes.

(14) "Shake splitter" - a stationary hydraulically operated wedge, manually controlled, used to split shake blocks into shake blanks or boards.

(15) "Shim saw" - a circular saw used to re-cut manufactured shingles into narrow widths.

(16) "Shingle machine" - a machine used to manufacture shingles; composed of a feed, set works, and carriage system, all functioning in relation to a circular saw.

(17) "Shingle saw" - a circular saw used to cut shingles from blocks.

(18) "Spault" - the first and last section(s) of a block as it is cut into shingles.

(19) "Spault catcher" - a device located on the shingle machine next to the solid feed rolls, used to hold the last section of each block being cut (called a spault), in place.

(20) "Track or swing cutoff saw" - a circular saw used to cut blocks from a log.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-70501, filed 8/27/81.]

**WAC 296-78-70503 Shake and shingle machinery—
General.** (1) Track or swing cutoff circular saw.

(a) Manually operated track or swing circular cutoff saws of the following types shall be set up, guarded and operated in accordance with WAC 296-24-16515, general safety and health standards:

- Saws into which materials to be cut are fed or positioned and/or held in position by hand pressure during the cutting stroke; and

- Saws on which the cutting stroke is propelled by manual (hand) pressure; and

- Saws on which the operator is within arm's reach of the blade when the blade is fully extended to the limit of operat-

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ing travel and the operator is standing at the operator's normal control station/location.

(b) Large track or swing circular cutoff saws into which materials to be cut are fed by powered live rolls, conveyor belts and/or chains and which are operated from a remote operator's control station, defined as beyond arm's reach when the blade is fully extended to the limit of operating travel, shall be set up, guarded and operated in accordance with the following:

(i) A power operated track or swing cutoff circular saw shall have controls so arranged that operators are not positioned directly in front of the saw while making a cut.

(ii) All track or swing cutoff circular saws shall be completely encased or guarded when the saw is in the retract position, except for that portion of the guard that must be left open for the operation of the saw.

(iii) Track or swing cutoff circular saw guards shall be constructed of sheet metal not less than one-eighth inch thick, or a wood guard of not less than nominal two inch thick wood material, or equivalent.

Hinged or removable doors or gates will be permitted where necessary to permit adjusting and oiling.

(iv) The driving belt(s) on the track or swing cutoff circular saw shall be guarded in accordance with the general safety and health standard, WAC 296-24-205 through 296-24-20533.

(v) A safety catch shall be provided to prevent the track cutoff saw from leaving the track.

(2) Overhead deck splitter - panagraph.

(a) Panagraph splitters shall have a shroud incorporated on the upper pressure plate to eliminate the possibility of the splitter moving from the operating area. This shroud shall be constructed of solid design with a minimum width of three inches and a minimum thickness of three-eighths inch.

(b) Mechanically operated overhead splitters shall have handles moving opposite the stroke of the piston.

(c) When the leading edge of the panagraph splitter is completely extended, the maximum clearance from the deck to the splitting edge shall be two inches.

(3) Power splitter saw. Power splitters shall have spreaders behind the saw to prevent materials from squeezing the saw or being thrown back on the operator. The top of the saw shall be completely covered.

(4) Knee bolter circular saw.

(a) A safety catch shall be provided to prevent the bolter carriage from leaving the track.

(b) Bolter saws shall be provided with a canopy guard of sheet metal not less than one-eighth inch thick, or cast iron guard not less than three-sixteenths inch thick or a wood guard of not less than nominal four inch thick wood material or equivalent.

The bolter canopy guard shall completely enclose the rear portion of the saw. It shall be so arranged and adjusted as to cover the front of the saw; not to exceed twenty inches from the top of the carriage to the bottom of the guard on sixteen inch and eighteen inch block and twenty-six inches on twenty-four inch blocks, of the material being cut.

(c) Bolter saws shall be provided with wipers of belting or other suitable material. These wipers shall be installed on

both sides of the saw in such a manner as to deflect knots, chips, slivers, etc., that are carried by the saw.

(d) A positive device shall be provided and used to manually lock and hold the feed table in the neutral position when not in use.

(e) That portion of all bolter saws which is below and behind the saw table shall be guarded by the exhaust hood or other device. Hinged or removable doors or gates will be permitted where necessary to permit adjusting and oiling.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-70503, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-70503, filed 8/27/81.]

WAC 296-78-70505 Shake machinery. (1) Shake splitters.

(a) A positive deenergizing device shall be provided within ready reach of each shake splitter operator.

(b) Each shake splitter shall be provided with an adjustable stroke limiter to eliminate the splitting blade from striking the table.

(c) All splitters shall have a maximum clearance of four inches, from the splitting edge to the table surface, when the splitter is in the extended position.

(d) All splitter tables shall have a friction surface to reduce kick out of the material being split.

(e) Shake splitters shall not be operated at a speed that would cause chunks to be thrown in such a manner as to create a hazard.

(f) The use of foot pedal (treadle) mechanisms shall be provided with protection to prevent unintended operation from falling or moving objects or by accidental stepping onto the pedal.

(i) The pedal shall have a nonslip surface.

(ii) The pedal return spring shall be of the compression type, operating on a rod or guided within a hole or tube, or designed to prevent interleaving of spring coils in event of breakage.

(iii) If pedal counterweights are provided, the path of the travel of the weight shall be enclosed.

(2) Shake saw guards.

(a) Every shake band saw shall be equipped with a saw guard on both sides of the blade down to the top side of the guide.

(b) The outside saw guard shall extend a minimum of three and one-half inches below the bottom edge of the saw guide.

(c) The maximum opening between the saw guide and table rolls shall be fifteen inches.

(3) Shake saw band wheel guards.

(a) The band wheels on all shake band saws shall be completely encased or guarded on both sides. The guards shall be constructed of not less than No. 14 U.S. gauge metal or material equal in strength.

(b) The metal doors, on such guards, shall have a wood liner of a minimum thickness of one-half inch.

(4) Shake saw band wheel speeds and maintenance.

(a) No band wheel shall be run at a peripheral speed in excess of that recommended by the manufacturer.

(b) Each band wheel shall be carefully inspected at least once a month by management.

Any band wheel in which a crack is found in the rim or in a spoke shall be immediately discontinued from service until properly repaired.

(c) Each band saw frame shall be provided with a tension indicator.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-70505, filed 8/27/81.]

WAC 296-78-70507 Upright shingle machine. (1) Upright shingle saw guard.

(a) Every shingle machine carriage shall be equipped with a hand guard which:

(i) Projects at least one inch beyond the cutting edge of the saw.

(ii) Shall be located not more than one-half inch from the side of the saw blade.

(b) Shingle saw guards shall have a rim guard so designed and installed as to prevent chips and knots from flying from the saws. Such guards shall cover the edge of the saw to at least the depth of the teeth, except such part of the cutting edge as is essential for sawing the material.

(c) Saw arbors and couplings shall be guarded to prevent contact.

(d) Every part of a clipper saw blade, except that part which is exposed to trim shingles, shall be enclosed by a guard, so designed and installed to prevent contact with the clipper saw. An additional guard shall be installed not more than four inches above the clipper board and not more than one-half inch from the vertical plane of the saw.

(e) The underside of clipper saw boards shall be equipped with a finger guard to effectively protect the operator's fingers. The guard shall be a minimum of five inches long and one and one-quarter inches deep.

(2) Upright carriage guards.

(a) Automatic revolving cam set works and rocker arms, on machine frame, shall be guarded where exposed to contact.

(b) The spault catchers shall be not less than three-sixteenths inch thick and kept sharp at all times. Missing teeth shall be replaced.

(3) Carriage feed works.

(a) The pinion gear, bull wheel and Johnson bar, operating the saw carriage, shall be guarded where exposed to contact.

(b) Each shingle machine clutch treadle shall be arranged so that it is necessary to manually operate the treadle to start the machine. Devices which start the machine when the jaw treadle is released shall not be installed or used. The carriage shall have a brake to hold it in a neutral position.

(c) Carriage speed shall not exceed thirty-four strokes per minute.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-70507, filed 8/27/81.]

WAC 296-78-70509 Related shake and shingle sawing machinery. (1) Flat or taper saw. A wood or metal guard or its equivalent shall be secured to the sliding table at the side nearest the sawyer to protect him from contact with the cutting edge of the saw when a block is not in the cut.

(2) Hip and ridge saws. The hip and ridge saws shall be guarded with a hood-like device. This guard shall cover that portion of the saw not needed to cut the material, located above the cutting table.

(a) The remaining portion of the saw, located below the table, shall be guarded to prevent contact by employees.

(b) The hip and ridge guarding standard is applicable to both shake and shingle hip and ridge saws.

(3) Shim stock saws. The top ends and sides of the shim stock saws shall be guarded. All shim stock saw power transmission mechanism shall be guarded.

(4) Shake or shingle groover. The top ends and sides of the groover, to include the press rolls, shall be guarded to contain material or debris which can be thrown and to prevent contact. All groover machine power transmission mechanism shall be guarded in compliance with WAC 296-78-710.

(5) Circular saws, speeds and repairs.

(a) Maximum allowable speeds.

(i) No circular saw shall be run at a speed in excess of that recommended by the manufacturer.

(ii) Such speed shall be etched or otherwise permanently marked on the blade, and that speed shall not be exceeded.

(b) Repairs and reconditions.

(i) Shingle saws when reduced in size to less than forty inches in diameter shall be discontinued from service as shingle saws on upright or vertical machines.

(ii) Shingle saws may be reconditioned for use as clipper saws provided the surface is reground and the proper balance attained.

(iii) Shingle saws may be used to no less than thirty-six inches on flat or taper saw machines.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-70509, filed 8/27/81.]

WAC 296-78-70511 Safety rules. (1) General.

(a) Workers shall not leave shingle machines unattended while the carriage is in motion.

(b) Shingle blocks shall not be piled more than one tier high on tables or roll cases. Chunks may be placed horizontally one tier high on top of shingle blocks. Shingle blocks shall be piled in a stable manner, not more than seventy-two inches high, within the immediate working area of the shingle sawyer or the area shall be barricaded.

(c) Provisions shall be made to prevent blocks from falling into the packing area.

(d) On each machine operated by electric motors, positive means shall be provided for rendering such controls or devices inoperative while repairs or adjustments are being made to the machines they control.

(e) Workers shall not stand on top of blocks while in the process of splitting other blocks into bolts.

(2) Jointers (shingle). Shingle jointers shall have the front, or cutting face of the knives, housed except for a narrow slot through which the shingles may be fed against the knives.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-70511, filed 8/27/81.]

WAC 296-78-710 Construction and isolated equipment.

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[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-710, filed 8/27/81.]

WAC 296-78-71001 General. (1) Construction when not specifically covered in these standards shall be governed by such other standards adopted by the department of labor and industries as may apply.

(2) All buildings, docks, tramways, walkways, log dumps and other structures shall be so designed, constructed, and maintained as to provide a safety factor of four. This means that all members shall be capable of supporting four times the maximum load to be imposed. This provision refers to buildings, docks and so forth designed and constructed subsequent to the effective date of these standards and also refers in all cases where either complete or major changes or repairs are made to such buildings, docks, tramways, walkways, log dumps and other structures.

(3) Basements on ground floors under mills shall be evenly surfaced, free from unnecessary obstructions and debris, and provided with lighting facilities in compliance with the requirements of the general occupational health standards, WAC 296-62-09003.

(4) All engines, motors, transmission machinery or operating equipment installed in mill basements or ground floors shall be equipped with standard safeguards for the protection of workers.

(5) Hazard marking. Physical hazard marking shall be as specified in WAC 296-24-135 through 296-24-13503 of the general safety and health standards.

(6) Flooring of buildings, ramps and walkways not subject to supporting motive equipment shall be of not less than two-inch wood planking or material of equivalent structural strength.

(7) Flooring of buildings, ramps, docks, trestles and other structure required to support motive equipment shall be of not less than full two and one-half inch wood planing or material of equivalent structural strength. However, where flooring is covered by steel floor plates, two inch wood planking or material of equivalent structural strength may be used.

(8) Walkways, docks, and platforms.

(a) Walkways, docks and platforms shall be constructed and maintained in accordance with the requirements of the general safety and health standards, WAC 296-24-735 through 296-24-75011.

(b) Maintenance. Walkways shall be evenly floored and kept in good repair.

(c) Where elevated platforms are used they shall be equipped with stairways or ladders in accordance with the general safety and health standards, WAC 296-24-765 through 296-24-81013.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71001, filed 8/27/81.]

WAC 296-78-71003 Floor and wall openings. (1) All floor and wall openings either temporary or permanent, shall be protected as required by the general safety and health standards, WAC 296-24-750 through 296-24-75011.

(2) The area under floor openings shall, where practical, be fenced off. When this is not practical, the areas shall be plainly marked with yellow lines and telltails shall be

installed to hang within five and one-half feet of the ground or floor level.

(3) Where floor openings are used to drop materials from one level to another, audible warning systems shall be installed and used to indicate to employees on the lower level that material is to be dropped.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-71003, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71003, filed 8/27/81.]

WAC 296-78-71005 Floors, docks, platforms and runways. (1) Faces of docks except on loading and unloading sides of rail and truck loading platforms, and runways used for the operation of lift trucks and other vehicles shall have a guard or shear timber eight by eight inches set over three inch blocks and securely fastened to the floor by bolts of not less than five-eighths inch diameter.

(2) The flooring of buildings, docks and passageways shall be kept in good repair at all times. When a hazardous condition develops that cannot be immediately repaired, the area shall be fenced off and not used until adequate repairs are made.

(3) All working areas shall be kept free from unnecessary obstruction and debris.

(4) Floors around machines and other places where workers are required to stand shall be provided with effective means to prevent slipping.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71005, filed 8/27/81.]

WAC 296-78-71007 Footwalks and passageways. (1) All footwalks and passageways subject to slipping hazards due to peculiarities of conditions or processes of the operation shall be provided with nonslip surfaces.

(2) Walkways in accordance with WAC 296-78-71001(8) shall be provided over roll casings, transfer tables, conveyors or other moving parts except where stepping over such equipment is not in connection with usual and necessary traffic.

(3) Walkways alongside of sorting tables shall be of sufficient width to provide safe working area. Such walkways shall be evenly floored and kept in good repair at all times. They shall be kept free from obstructions and debris.

(4) When employees are required to clear plug-ups in veneer trays or lumber sorting trays, adequate walkways with standard guardrails shall be provided for access to the trays whenever possible. When walkways are not provided, safety belts or harnesses with lanyards, tied off to substantial anchorages, shall be provided and used at all times.

(5) Walkways and stairways with standard hand rails shall be provided wherever space will permit, for oilers and other employees whose duties require them to go consistently to elevated and hazardous locations.

(a) Where such passageways are over walkways or work areas, standard toeboards shall be provided.

(b) Protection as required by the general safety and health standard, WAC 296-24-205 through 296-24-20533 shall be provided against contact with transmission machinery or moving conveyors.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71007, filed 8/27/81.]

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WAC 296-78-71009 Stairways and ladders. (1) Stairways shall be used in preference over ladders wherever possible. Stairways or ladders, whichever is used, shall be constructed and maintained in accordance with the provisions of the general safety and health standard, WAC 296-24-75009 through 296-24-81013.

(2) Doors shall not open directly on a flight of stairs.

(3) Permanent ladders shall be fastened securely at both top and bottom.

(4) Portable ladders shall not be used upon footing other than suitable type.

(5) Hooks or other means of securing portable ladders when in use, shall be provided.

(6) Portable ladders shall not be used for oiling machinery which is in motion.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71009, filed 8/27/81.]

WAC 296-78-71011 Egress and exit. (1) In all enclosed buildings, means of egress shall be provided in accordance with the provisions of the general safety and health standard, WAC 296-24-550 through 296-24-56531.

(2) All swinging doors shall be provided with windows, the bottom of which shall be not more than forty-eight inches above the floor. One window shall be provided for each section of double swinging doors. All such windows shall be of shatter proof or safety glass unless otherwise protected against breakage.

(3) Outside exits shall open outward. Where sliding doors are used as exits, an inner door not less than two feet six inches by six feet shall be cut inside each of the main doors and arranged to open outward.

(4) At least two fire escapes or substantial outside stairways, shall be provided for mill buildings where the floor level is more than eight feet above the ground.

(a) Buildings over one hundred fifty feet in length shall have at least one additional fire escape or substantial outside stairway for each additional one hundred fifty feet of length or fraction thereof.

(b) Passageways to fire escapes or outside stairways shall be marked and kept free of obstructions at all times.

(c) Fire protection. The requirements of WAC 296-24-585 through 296-24-62003 of the general safety and health standard, shall be complied with in providing the necessary fire protection for sawmills.

(d) Fire drills shall be held at least quarterly and shall be documented.

(5) Where a doorway opens upon a roadway, railroad track, or upon a tramway or dock over which vehicles travel, a barricade or other safeguard and a warning sign shall be placed to prevent workers from stepping directly into moving traffic.

(6) Tramways and trestles shall be substantially supported by piling or framed bent construction which shall be frequently inspected and maintained in good repair at all times. Tramways or trestles used both for vehicular and pedestrian traffic shall have a walkway with standard hand rail at the outer edge and shear timber on the inner edge, and shall provide three feet clearance to vehicles. When walkways cross over other thoroughfares, they shall be solidly

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fenced at the outer edge to a height of 42 inches over such thoroughfares.

(7) Where tramways and trestles are built over railroads they shall have a vertical clearance of twenty-two feet above the top of the rails. When constructed over carrier docks or roads, they shall have a vertical clearance of not less than six feet above the drivers foot rest on the carrier, and in no event shall this clearance be less than twelve feet from the surface of the lower roadway or dock.

(8) Walkways (either temporary or permanent) shall be not less than twenty-four inches wide and two inches thick, nominal size, securely fastened at each end. When such walkways are used on an incline the angle shall not be greater than twenty degrees from horizontal.

(9) Walkways from the shore or dock to floats or barges shall be securely fastened at the shore end only and clear space provided for the other end to adjust itself to the height of the water.

(10) Cleats of one by four inch material shall be fastened securely across walkways at uniform intervals of eighteen inches whenever the grade is sufficient to create a slipping hazard.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71011, filed 8/27/81.]

WAC 296-78-71013 Cableways. (1)(a) Inclined cableways shall have a central line between the rails in practical alignment with the center of the hoisting drums. A substantial bumper shall be installed at the foot of each incline.

(b) Barricades or warning signs shall be installed to warn pedestrians to stand clear of the cables on inclined cableways. The cables shall not be put into motion without activating an alarm system, either audible or visible, which will inform anyone on the tracks to stand clear.

(2) Employees shall not ride on or stand below the cars on an inclined cableway.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71013, filed 8/27/81.]

WAC 296-78-71015 Tanks and chemicals. (1) All open vats and tanks into which workers may fall shall be guarded with standard railings or screen guards in all cases where such guarding is possible with regard to practical operation.

(2) Foundations of elevated tanks shall be accessible for inspections. When the tank platform is more than five feet above the ground a stairway or ladder shall be permanently attached.

(3) Every open tank over five feet in height shall be equipped with fixed standard ladders both inside and out, extending from the bottom to the rim of the tank arranged to be accessible to each other, so far as local conditions permit.

(4) The use of chemicals for treating of lumber for prevention of sap stain or mold or as preservatives, shall conform to the requirements of WAC 296-62-11021, open surface tanks.

(a) Storage, handling, and use of chemicals. Threshold limits. Employees shall not be exposed to airborne concentration of toxic dusts, vapors, mists or gases that exceed the threshold limit values set forth in chapter 296-24 WAC, Part

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A-2, general safety and health standards, and chapter 296-62 WAC, Part E, general occupational health standards.

(b) Protective equipment. The use of chemicals shall be controlled so as to protect employees from harmful exposure to toxic materials. Where necessary, employees shall be provided with and required to wear such protective equipment as will afford adequate protection against harmful exposure as required by chapter 296-24 WAC, Part A-2, general safety and health standards, and chapter 296-62 WAC, Part E, general occupational health standards.

(5)(a) Means shall be provided and used to collect any excess of chemicals used in treating lumber so as to protect workers from accidental contact with harmful concentrations of toxic chemicals or fumes.

(b) Dip tanks containing flammable or combustible liquids shall be constructed, maintained and used in accordance with WAC 296-24-405 of the general safety and health standards.

(c) An evacuation plan shall be developed and implemented for all employees working in the vicinity of dip tanks using flammable and/or combustible liquids. A copy of the plan shall be available at the establishment for inspection at all times. Every employee shall be made aware of the evacuation plan and know what to do in the event of an emergency and be evacuated in accordance with the plan. The plan shall be reviewed with employees at least quarterly and documented.

(d) When automatic foam, automatic carbon dioxide or automatic dry chemical extinguishing systems are used, an alarm device shall be activated to alert employees in the dip tank area before and during the activation of the system. The following combinations of extinguishment systems when used in conjunction with the evacuation plan as stated above will be acceptable in lieu of bottom drains:

(i) A dip tank cover with an automatic foam extinguishing system under the cover, or an automatic carbon dioxide system, or an automatic dry chemical extinguishing system, or an automatic water spray extinguishing system;

(ii) An automatic dry chemical extinguishing system with an automatic carbon dioxide system or a second automatic dry chemical extinguishing system or an automatic foam extinguishing system;

(iii) An automatic carbon dioxide system with a second automatic carbon dioxide system or an automatic foam extinguishing system.

(e) The automatic water spray extinguishing systems, automatic foam extinguishing systems, and dip tank covers shall conform with the requirements of WAC 296-24-405. The automatic carbon dioxide systems and dry chemical extinguishing system shall conform with the requirements of WAC 296-24-615 and 296-24-620.

(6) Where workers are engaged in the treating of lumber with chemicals or are required to handle lumber or other materials so treated, the workers shall be provided with, at no cost to the worker, and required to use such protective equipment as will provide complete protection against contact with toxic chemicals or fumes therefrom.

(7) Sanitation requirements. The requirements of WAC 296-24-120 through 296-24-13013 of the general safety and health standards, shall govern sanitation practices.

(8) The sides of steam vats and soaking pits unless otherwise guarded shall extend forty-two inches above the floor level. The floor adjacent thereto shall be of nonslip construction.

(9) Large steam vats or soaking pits, divided into sections, shall be provided with substantial walkways between each section, each walkway to be provided with standard railings which may be removable if necessary.

(10) Covers shall be removed only from that portion of the steaming vats on which workers are working and a portable railing shall be placed at this point to protect the operators.

(11) Workers shall not ride or step on logs in steam vats.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-71015, filed 8/20/96, effective 10/15/96; 94-20-057 (Order 94-16), § 296-78-71015, filed 9/30/94, effective 11/20/94. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71015, filed 8/27/81.]

WAC 296-78-71017 Dry kilns. (1) Dry kilns shall be so constructed upon solid foundations that tracks will not sag. Dry kilns shall be provided with suitable walkways. Each kiln shall have doors that operate from the inside and be provided with escape doors of adequate height and width to accommodate an average size man, that also operates from the inside, and shall be located in or near the main door. Escape doors shall swing in the direction of exit. Kiln doors and door carriers shall be fitted with safety devices to prevent the doors or carriers from falling.

(2) Ladders. A fixed ladder, in accordance with the requirements of WAC 296-24-810 through 296-24-81013 of the general safety and health standards, or other means shall be provided to permit access to the roof. Where controls and machinery are mounted on the roof, a permanent stairway with standard handrail shall be installed in accordance with the requirements of WAC 296-24-765 through 296-24-76523 of the general safety and health standards.

(3) A heated room shall be provided for the use of the kiln operator in inclement weather. He should remain in such room for at least ten minutes after leaving a hot kiln before going to cold outside air.

(4) Where operating pits are used, they shall be well ventilated, drained and lighted. Substantial gratings shall be installed at the kiln floor line. Steam lines shall be provided with insulation wherever exposed to contact by employees. Fans shall be enclosed by standard safeguards.

(5) Mechanical equipment. All belts, pulleys, blowers, and other exposed moving equipment used in or about kilns shall be guarded in accordance with the requirements of WAC 296-24-205 through 296-24-20533 of the general safety and health standards.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-71017, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71017, filed 8/27/81.]

WAC 296-78-71019 Exhaust systems. (1) Air requirements in buildings, where persons are habitually employed, shall meet the requirements of the general occupational health standard, WAC 296-62-100 through 296-62-11013.

(2) Where the natural ventilation is not sufficient to remove dust, fumes or vapors that create or constitute a hazard, additional means of removal shall be provided.

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(3) All mills containing one or more machines whose operations create dust, shavings, chips or slivers during a period of time equal to or greater than one-fourth of the working day or shift, shall be equipped with a collecting system either continuous or automatic in action and of sufficient strength and capacity to thoroughly remove such refuse from the points of operation of the machines and the work areas.

(4) Each woodworking machine that creates dust, shavings, chips, or slivers shall be equipped with an exhaust or conveyor system located and adjusted to remove the maximum amount of refuse from the point of operation and immediate vicinity.

(5) Blower, collecting and exhaust systems shall be designed, constructed and maintained in accordance with American National Standards Z33.1 - 1961 (for the installation of blower and exhaust systems for dust, stock and vapor removal or conveying) and Z12.2 - 1962 (R1969) (code for the prevention of dust explosions in woodworking and wood flour manufacturing plants).

(6) Fans used for ventilating shall be of ample capacity, as evidenced by the performance schedules of the manufacturers, and shall be guarded when exposed to contact. Hoods, dust conveyors, dust collectors and other accessory equipment shall be large enough to insure free intake and discharge.

(7) The outlet or discharge of all ventilating equipment shall be so arranged that at no time will the dust, vapors, gases or other air borne impurities discharged, create or constitute a hazard.

(8) Where a hood is used to form a part or all of the guard required on a given machine, it shall be constructed of not less than ten U.S. gauge sheet metal, or if of cast iron it shall be not less than three-sixteenths inches in thickness.

(9) All exhaust pipes shall be of such construction and internal dimensions as to minimize the possibility of clogging. They shall be readily accessible for cleaning.

(10) All exhaust pipes shall empty into settling or dust chambers which shall effectively prevent the dust or refuse from entering any work area. Such settling or dust chambers shall be so designed and operated as to reduce to a minimum the danger of fire or dust explosions.

(11) In lieu of a general ventilating system, exhaust or blower units may be installed on the dust or fume producing machine, provided the required protection is secured thereby.

(12) When proper ventilation is not provided, and temporary hazardous conditions are therefore encountered, the employer shall furnish approved respiratory and visual equipment: *Provided, however,* That the exposure to such hazard shall not be for more than two hours duration. Protective measures and equipment shall meet the requirements of the general occupational health standard, WAC 296-62-070 through 296-62-09001 and the requirements of the general safety and health standard, WAC 296-24-081 through 296-24-08113.

(13) Provisions for the daily removal of refuse shall be made in all operations not required to have an exhaust system, or having refuse too heavy, or bulky, or otherwise unsuitable to be handled by an exhaust system.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71019, filed 8/27/81.]

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WAC 296-78-71021 Spray painting. All spray painting operations shall be carried on in accordance with the requirements of the general safety and health standard, WAC 296-24-370 through 296-24-37027 and the general occupational health standard, WAC 296-62-11019.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71021, filed 8/27/81.]

WAC 296-78-71023 Lighting. The lighting and illumination requirements of the general occupational health standards, WAC 296-62-09003, shall apply.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 82-13-045 (Order 82-22), § 296-78-71023, filed 6/11/82. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71023, filed 8/27/81.]

WAC 296-78-71025 Gas piping and appliances. All gas piping and appliances shall be installed in accordance with the American National Standard Requirements for Gas Appliances and Gas Piping Installations, Z21.30 - 1964.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71025, filed 8/27/81.]

WAC 296-78-715 Mechanical, steam and electrical equipment.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-715, filed 8/27/81.]

WAC 296-78-71501 General provisions. (1) All machinery or other equipment located or used on the premises of the operation or in the processes incidental thereto, shall be provided and maintained with approved standard safeguards, irrespective of ownership.

(2) Machines shall be so located that each operator will have sufficient space in which to handle material with the least possible interference from or to other workers or machines.

(3) Machines shall be so placed that it will not be necessary for the operator to stand where passing traffic creates a hazard.

(4) Aisles of sufficient width to permit the passing of vehicles or employees without crowding shall be provided in all work areas and stock or storage rooms.

(5) All metal decking around machinery shall be equipped to effectively prevent slipping.

(6) All machinery or equipment started by a control so located as to create impaired vision of any part of such machinery or equipment shall be provided with an audible warning device, where such machinery or equipment is exposed to contact at points not visible to the operator. Such devices shall be sounded before starting up unless positive mechanical or electrical interlocking controls are provided which will prevent starting until all such posts are cleared.

(7) A mechanical or electrical power control device shall be provided at each machine which will make it possible for the operator to stop the machine feed without leaving his position at the point of operation.

(8) All machines operated by means of treadles, levers, or other similar devices, shall be provided with positive and approved nonrepeat devices except where such machine is being used as an automatic repeating device.

(9) Operating levers and treadles on all machines or machinery shall be so located and protected that they cannot be shifted or tripped accidentally.

(10) All power driven machinery shall be stopped and brought to a complete standstill before any repairs or adjustments are made or pieces of material or refuse removed, except where motion is necessary to make adjustments.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71501, filed 8/27/81.]

WAC 296-78-71503 Lock out—Tag out. (1) To avoid accidental activation of machinery, electrical devices or other equipment which could create a hazardous condition while performing maintenance, repair, cleanup or construction work, the main disconnect(s) (line circuit breakers) shall first be locked out and tagged in accordance with the following provisions:

(2) Effective date. Effective July 1, 1982, only padlocks or other equivalent protective devices shall be used for locking out the main disconnect(s) (line circuit breakers) of machinery, electrical devices or other equipment that is shut down while maintenance, repair, cleanup, construction work or other type of work is done to the equipment. Tags shall be used to supplement the padlocks or other equivalent protective devices, and shall be used only for informational purposes.

(3) Padlocks, tags or equivalent protective devices to be supplied. The employer shall supply and the employee(s) shall use as many padlocks or other equivalent protective devices as are necessary to effectively lock out all affected equipment.

(4) Lock out plan. An effective lock out plan shall be formulated in writing and all concerned employees so informed. The plan shall contain specific procedures for locking out equipment, information to be contained on supplemental tags and specific procedures for unlocking equipment after repairs, cleanup, etc., have been completed.

(5) Informational tags. Tags used for providing supplemental information with lock out padlocks or other equivalent protective devices shall contain the name of the person authorizing placement, reason for placing, date, signature of person placing tag and such other relative information as deemed necessary by the person placing the tag.

(6) Lock out by pushbutton only. Locking out a machine or item of equipment by use of a pushbutton or other local control device only will not be acceptable as meeting the intent of these rules.

(7) Coordination of locking out devices. When repair, adjustment, cleanup, maintenance or construction work is necessary and the lock out procedures must be followed by any person not familiar with all power sources or material entry sources to any area involved, that person shall consult with the operator, supervisor, or some person that is capable of informing him of proper lock out procedures and supplemental tagging information.

(8) Lock out before removing guards. Equipment shall be stopped and locked out before employees remove guards or reach into any potentially hazardous area. The only exception to this rule will be when equipment must be in motion in order to make proper adjustments.

(9) Removal of lock outs. Each person actively engaged in the repair, maintenance, cleanup, etc., shall lock out the affected equipment and place the informational tag. Upon completion of the work and reinstallation of the guards, that person shall personally remove his lock and tag, except when it is positively determined that an employee has left the premises without removing his lock and tag, other persons may remove the locks and tags in accordance with a procedure formulated by each firm and approved by the division of industrial safety and health.

(10) Valves to be locked and tagged out. Each valve used to control the flow of hazardous materials into, or used to activate the equipment being worked on, shall be locked and tagged out.

(11) Piping systems deactivated. Prior to working on piping systems containing pressurized or hazardous materials, the valve(s) controlling the flow to the affected area shall be locked and tagged out. The piping in the area to be worked on shall be drained and purged, if needed. If the piping contains hazardous materials, the piping shall be isolated from the work area by the insertion of blank flanges in the piping system.

(12) Pipe lines without valves. If pipelines or ducts are constructed without valves or closures that can be locked out, the lines or ducts shall be broken at a flange and a blank flange inserted to stop accidental flow of any hazardous material.

(13) Testing after lock out. After locking out and tagging equipment, a test shall be conducted to ascertain that the equipment has been made inoperative or the flow of hazardous material has been positively stopped. Precautions shall be taken to ascertain that persons will not be subjected to hazard while conducting the test if power source or flow of material is not shut off.

(14) Temporary or alternate power to be avoided. Whenever possible, temporary or alternate sources of power to the equipment being worked on shall be avoided. If the use of such power is necessary, all affected employees shall be informed and the source of temporary or alternate power shall be identified.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71503, filed 8/27/81.]

WAC 296-78-71505 Mechanical power transmission apparatus. (1) Machines and other equipment shall not be oiled while in motion, unless provided with guards or other devices to permit oiling without any possibility of contact with moving parts of machinery.

(2) Inspections shall be made to assure that shaftings, bearings and machines are in proper alignment at all times and that bolts in shaft hangars, couplings and boxes are tight.

(3) Isolated bearings or other equipment not reached by walkway shall be served by a ladder or other means of safe access.

(4) Running belts under power on or off pulleys shall be accomplished by mechanical means which will not expose employees to moving elements of the operation.

(5) Counterweights located on or near passageways or work areas shall be provided with enclosures. Overhead

counterweights shall be provided with substantial safety chains or cables, or otherwise secured against falling.

(6) The construction, operation, and maintenance of all mechanical power-transmission apparatus shall be in accordance with the requirements of WAC 296-24-205 through 296-24-20533 of the general safety and health standard.

(7) Baffles shall be erected, where necessary, to protect employees from breaking belts, chains, ropes or cables.

(8) Overhead horizontal belts, chains or rope drives shall be provided with guards.

(9) Hydraulic systems. Means shall be provided to block, chain, or otherwise secure equipment normally supported by hydraulic pressure so as to provide for safe maintenance.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-71505, filed 8/27/81.]

WAC 296-78-720 Boiler and pressure vessels. Boilers and pressure vessels shall be constructed, maintained and inspected in accordance with the provisions of the boiler and unfired pressure vessel law, chapter 70.79 RCW, and chapter 296-104 WAC as administered by the boiler inspection section of the department of labor and industries.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-720, filed 8/27/81.]

WAC 296-78-725 Nonionizing radiation. (1) Only qualified and trained employees shall be assigned to install, operate, adjust, and maintain laser equipment. Proof of qualification of the laser equipment operator shall be available and in possession of operator at all times.

(2) Employees, when working in areas in which a potentially hazardous exposure (see WAC 296-62-09005(4)) to direct or reflected laser radiation exists, shall be provided with antilaser eye protection devices specified in WAC 296-62-09005, general occupational health standards.

(3) Areas in which lasers are used shall be posted with standard laser warning placards.

(4) Beam shutters or caps shall be utilized, or the laser turned off, when laser transmission is not actually required. When the laser is left unattended for a substantial period of time, such as during lunch hour, overnight, or at change of shifts, the laser shall be turned off or shutters or caps shall be utilized.

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

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

(7) The laser equipment shall bear such labels, logos and data placards to indicate maximum output and class designation as required of the manufacturer at time of sale, by I.A.W. Part 1040, CFR Title 21. Such labels, logos, data placards, etc., shall be maintained in a legible condition.

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

(9) Employees shall not be exposed to light intensities in excess of:

(a) Direct staring: One micro-watt per square centimeter;

(b) Incidental observing: One milliwatt per square centimeter;

- (c) Diffused reflected light: Two and one-half watts per square centimeter.
- (10) The laser equipment shall not be modified except by the manufacturer.
- (11) Laser unit in operation shall be set up above the heads of the employees, when possible.
- (12) Employees shall not be exposed to radio frequency/microwave radiation in excess of the permissible exposure limits specified in WAC 296-62-09005.

[Statutory Authority: Chapter 49.17 RCW, 96-17-056, § 296-78-725, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-18-029 (Order 81-21), § 296-78-725, filed 8/27/81.]

WAC 296-78-730 Electrical service and equipment.

- (1) Electrical service and equipment shall be constructed, maintained, inspected and operated according to chapter 296-24 WAC, General safety and health standards, Part L.
- (2) Repairs. Electrical repairs shall be made only by authorized and qualified personnel.
- (3) Identification. Marks of identification on electrical equipment shall be clearly visible.
- (4) Protective equipment. Rubber protective equipment shall be provided as required by WAC 296-24-092(1) of the general safety and health standard.
- (5) Open switches. Before working on electrical equipment, switches shall be open and shall be locked out.
- (6) Concealed conductors. Where electrical conductors are known to be concealed, no work shall be performed until such conductors are located.
- (7) Overload relays. Overload relays shall be reset by authorized qualified personnel only.
- (8) Passageways to panels. Passageways to switch centers or panels shall at all times be kept free from obstruction. Not less than three feet of clear space shall be maintained in front of switch centers or panels at all times.
- (9) Bridging fuses. Fuses shall not be doubled or bridged.

[Statutory Authority: Chapter 49.17 RCW, 91-24-017 (Order 91-07), § 296-78-730, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-18-029 (Order 81-21), § 296-78-730, filed 8/27/81.]

WAC 296-78-735 Elevators, moving walks. Elevators, moving walks and other lifting devices intended for either passenger or freight service shall be constructed, maintained, inspected and operated in accordance with the provisions of chapter 70.87 RCW, WAC 296-24-870 through 296-24-90009 of the general safety and health standards, and those specific standards which are applicable from the division of building and construction safety inspection services, elevator section.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-18-029 (Order 81-21), § 296-78-735, filed 8/27/81.]

WAC 296-78-740 Transportation—Lumber handling equipment—Cranes—Construction. (1) All apparatus shall be designed throughout, with not less than the following factors of safety, under static full rated load stresses, based on ultimate strength of the material used:

Material	Factor of Safety
Cast iron	12

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Material	Factor of Safety
Cast steel	8
Structural steel	5
Forged steel	5
Cables	5

(2) A notice shall be placed on every crane and hoist showing the maximum allowable load in pounds or tons. This notice shall be placed in such a manner as to be clearly legible from the floor.

(3) Cranes shall be of what is known as "all steel construction." No cast iron shall be used in parts subject to tension except in drums, trolley sides, bearings, brackets and brake shoes.

(4) The construction of cranes shall be such that all parts may be safely lubricated and inspected when cranes are not in operation.

(5) Bolts subject to stress shall be of the through type and all bolts shall be equipped with approved protection so that the bolt will not work loose or nuts work off.

(6) Outside crane cages shall be enclosed. There shall be windows on three sides of the cage and windows in the front, and the side opposite the door shall be the full width of the cage.

(7) Where a tool box or receptacle is used for the storing of oil cans, tools, etc., it shall be permanently secured in the cage or on the foot-walk of outside cranes and on the foot-walk of inside cranes. Tool boxes of hot metal cranes shall be constructed of metal.

(8) All gears on cranes shall be provided with standard guards.

(9) Keys projecting from revolving shafts shall be guarded.

(10) A braking apparatus shall be provided on every type of crane and shall be so designed and installed as to be capable of effectually braking a weight of at least one and one-half times the full rated load.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-18-029 (Order 81-21), § 296-78-740, filed 8/27/81.]

WAC 296-78-745 Electrical equipment. (1) All exposed current-carrying parts except conductors, connected to circuits above three hundred volts to ground shall be so isolated, insulated, or guarded that no employee can come in contact with them. Exposed parts less than 300 volts shall be protected in some suitable way against possible accidental contact. Exposed metallic parts of conduit armored cable or molding shall be permanently grounded.

(2) Guards for the current-carrying parts of unisolated electrical equipment, such as controllers, motors, transformers, automatic cutouts, circuit breakers, switches, and other devices shall consist of cabinets, casings, or shields of permanently grounded metal or of insulating material.

(3) All parts of electrical equipment, such as fuses and the handles and arc chutes of circuit breakers, shall be so isolated or guarded that the liability of employees being struck or burned by sparking, flashing or movement during operation is reduced to a minimum.

(4) All exposed noncurrent carrying metal parts of electrical equipment shall be permanently grounded. The ground

connection through well bonded track rails will be considered satisfactory.

(5) The metallic parts of portable cranes, derricks, hoists, and similar equipment on which wires, cables, chains, or other conducting objects are maintained shall be provided with an effective protective ground, where operated in the vicinity of supply lines.

(6) Readily accessible means shall be provided whereby all conductors and equipment located in cranes can be disconnected entirely from the source of energy at a point as near as possible to the main current collectors.

(7) Means shall be provided to prevent the starting and operation of equipment by unauthorized persons.

(8) The control levers of traveling cranes shall be so located that the operator can readily face the direction of travel.

(9) A hoist limiting device shall be provided for each hoist.

(10) All fuses shall be of the enclosed arcless type.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-745, filed 8/27/81.]

WAC 296-78-750 Chains, wire rope, cables and fiber rope. (1) Ropes, cables, slings, and chains.

(a) Safe usage. Ropes, cables, slings, and chains shall be used in accordance with safe use practices recommended by the manufacturer or within safe limits recommended by the equipment manufacturer when used in conjunction with it.

Work by qualified persons. Installation, inspection, maintenance, repair, and testing of ropes, cables, slings, and chains shall be done only by persons qualified to do such work.

(b) Proof testing. The employer shall ensure that before use, each new, repaired, or reconditioned alloy steel chain sling, including all welded components in the sling assembly, shall be proof tested by the sling manufacturer or equivalent entity, in accordance with paragraph 5.2 of the American Society of Testing and Materials Specification A391.65 (ANSI G61.1-1968). The employer shall retain the certificate of the proof test and shall make it available for examination. When a chain sling assembly is made up of segments of proof tested alloy chain and proof tested individual components such as mechanical coupling links, hooks and similar devices; it is not necessary to test the assembled unit, when appropriate test certification of individual components is available and the assembled sling is appropriately tagged by the manufacturer or equal entity. The sling shall not be used in excess of the rated capacity of the weakest component.

(c) Slings. Slings and their fittings and fastenings, when in use, shall be inspected daily for evidence of overloading, excessive wear, or damage. Slings found to be defective shall be removed from service.

(2) Proper storage shall be provided for slings while not in use.

(3) Protection shall be provided between the sling and sharp unyielding surfaces of the load to be lifted.

(4) Hooks. No open hook shall be used in rigging to lift any load where there is hazard from relieving the tension on the hook from the load or hook catching or fouling.

(5) Ropes or cables. Wire rope or cable shall be inspected when installed and once each day thereafter, when in use. It shall be removed from hoisting or load-carrying service when kinked or when one of the following conditions exist:

(a) When three broken wires are found in one lay of 6 by 6 wire rope.

(b) When six broken wires are found in one lay of 6 by 19 wire rope.

(c) When nine broken wires are found in one lay of 6 by 37 wire rope.

(d) When eight broken wires are found in one lay of 8 by 19 wire rope.

(e) When marked corrosion appears.

(f) Wire rope of a type not described herein shall be removed from service when four percent of the total number of wires composing such rope are found to be broken in one lay.

(g) Condemned. When wire rope, slings or cables deteriorate through rust, wear, broken wires, kinking or other conditions, to the extent there is a reasonable doubt that the necessary safety factor is maintained, the use of such equipment shall be discontinued.

(6) Wire rope removed from service due to defects shall be plainly marked or identified as being unfit for further use on cranes, hoists, and other load-carrying devices.

(7) The ratio between the rope diameter and the drum, block, sheave, or pulley tread diameter shall be such that the rope will adjust itself to the bend without excessive wear, deformation, or injury. In no case shall the safe value of drums, blocks, sheaves, or pulleys be reduced when replacing such items unless compensating changes are made for rope used and for safe loading limits.

(8) Drums, sheaves, and pulleys. Drums, sheaves, and pulleys shall be smooth and free from surface defects liable to injure rope. Drums, sheaves, or pulleys having eccentric bores or cracked hubs, spokes, or flanges shall be removed from service.

(9) Connections. Connections, fittings, fastenings, and other parts used in connection with ropes and cables shall be of the quality, size and strength recommended by the manufacturer for the use intended. These connections shall be installed in accordance with the manufacturer's recommendations.

(10) Socketing, splicing, and seizing.

(a) Socketing, splicing, and seizing of cables shall be performed only by qualified persons.

(b) All eye splices shall be made in a manner recommended by the manufacturer and wire rope thimbles of proper size shall be fitted in the eye, except that in slings the use of thimbles shall be optional.

(11) Wire rope clips attached with U-bolts shall have these bolts on the dead or short end of the rope. The U-bolt nuts shall be retightened immediately after initial load carrying use and at frequent intervals thereafter. The number and spacing of clips shall be as follows:

Improved Plow Steel Diameter of Rope	Number of Clips (Drop Forged)	Required Other Material	Minimum Space Between Clips
3/8 to 5/8"	3	4	3-3/4"
3/4"	4	5	4-1/2"
7/8"	4	5	5-1/4"
1 "	5	6	6 "
1-1/8"	6	6	6-3/4"
1-1/4"	6	7	7-1/2"
1-3/8"	7	7	8-1/4"
1-1/2"	7	8	9 "

(a) When a wedge socket-type fastening is used, the dead or short end of the cable shall be clipped with a U-bolt or otherwise made secure against loosening.

(b) Fittings. Hooks, shackles, rings, pad eyes, and other fittings that show excessive wear or that have been bent, twisted, or otherwise damaged shall be removed from service.

(12) Running lines. Running lines of hoisting equipment located within six feet six inches of the ground or working level shall be boxed off or otherwise guarded, or the operating area shall be restricted.

(13) Preventing abrasion. The reeving of a rope shall be so arranged as to minimize chafing or abrading while in use.

(14) Sheave guards. Bottom sheaves shall be protected by close fitting guards to prevent cable from jumping the sheave.

(15) There shall be not less than two full wraps of hoisting cable on the drums of cranes and hoists at all times of operation.

(16) Where the cables are allowed to pile on the drums of cranes, the drums shall have a flange at each end to prevent the cables from slipping off the drum.

(17) Chains. Chains used in load carrying service shall be inspected before initial use and weekly thereafter.

If at any time any three-foot length of chain is found to have stretched one-third the length of a link it shall be discarded.

(18) Chains shall be spliced in compliance with the requirements of the general safety and health standard, WAC 296-24-29413.

(19) Wherever annealing of chains is attempted, it shall be done in properly equipped annealing furnaces and under the direct supervision of a competent person thoroughly versed in heat treating.

Chain shall be normalized or annealed periodically as recommended by the manufacturer.

(20) Fiber rope.

(a) Frozen fiber rope shall not be used in load carrying service.

(b) Fiber rope that has been subjected to acid shall not be used for load carrying purposes.

(c) Fiber rope shall be protected from abrasion by padding where it is fastened or drawn over square corners or sharp or rough surfaces.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-750, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-750, filed 8/27/81.]

WAC 296-78-755 Natural and synthetic fiber rope slings. (1) Sling use.

(1999 Ed.)

(a) Fiber rope slings made from conventional three strand construction fiber rope shall not be used with loads in excess of the rated capacities prescribed in Tables D-16 through D-19 of Part "D" of the general safety and health standards, chapter 296-24 WAC.

(b) Slings not included in these tables shall be used only in accordance with the manufacturer's recommendations.

(2) Safe operating temperatures. Natural and synthetic fiber rope slings, except for wet frozen slings, may be used in a temperature range from minus 20°F to plus 180°F without decreasing the working load limit. For operations outside this temperature range and for wet frozen slings, the sling manufacturer's recommendations shall be followed.

(3) Splicing. Spliced fiber rope slings shall not be used unless they have been spliced in accordance with the following minimum requirements and in accordance with any additional recommendations of the manufacturer:

(a) In manila rope, eye splices shall consist of at least three full tucks, and short splices shall consist of at least six full tucks, three on each side of the splice center line.

(b) In synthetic fiber rope, eye splices shall consist of at least four full tucks, and short splices shall consist of at least eight full tucks, four on each side of the center line.

(c) Strand end tails shall not be trimmed flush with the surface of the rope immediately adjacent to the full tucks. This applies to all types of fiber rope and both eye and short splices. For fiber rope under one inch in diameter, the tail shall project at least six rope diameters beyond the last full tuck. For fiber rope one inch in diameter and larger, the tail shall project at least six inches beyond the last full tuck. Where a projecting tail interferes with the use of the sling, the tail shall be tapered and spliced into the body of the rope using at least two additional tucks (which will require a tail length of approximately six rope diameters beyond the last full tuck).

(d) Fiber rope slings shall have a minimum clear length of rope between eye splices equal to ten times the rope diameter.

(e) Knots shall not be used in lieu of splices.

(f) Clamps not designed specifically for fiber ropes shall not be used for splicing.

(g) For all eye splices, the eye shall be of such size to provide an included angle of not greater than sixty degrees at the splice when the eye is placed over the load or support.

(4) End attachments. Fiber rope slings shall not be used if end attachments in contact with the rope have sharp edges or projections.

(5) Removal from service. Natural and synthetic fiber rope slings shall be immediately removed from service if any of the following conditions are present:

(a) Abnormal wear.

(b) Powdered fiber between strands.

(c) Broken or cut fibers.

(d) Variations in the size or roundness of strands.

(e) Discoloration or rotting.

(f) Distortion of hardware in the sling.

(6) Repairs. Only fiber rope slings made from new rope shall be used. Use of repaired or reconditioned fiber rope slings is prohibited.

[Title 296 WAC—p. 1837]

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-755, filed 8/27/81.]

WAC 296-78-760 Synthetic web slings. (1) Sling identification. Each sling shall be marked or coded to show the rated capacities for each type of hitch and type of synthetic web material.

(2) Webbing. Synthetic webbing shall be of uniform thickness and width and selvage edges shall not be split from the webbing's width.

(3) Fittings. Fittings shall be:

(a) Of a minimum breaking strength equal to that of the sling; and

(b) Free of all sharp edges that could in any way damage the webbing.

(4) Attachment of end fittings to webbing and formation of eyes. Stitching shall be the only method used to attach end fittings to webbing and to form eyes. The thread shall be in an even pattern and contain a sufficient number of stitches to develop the full breaking strength of the sling.

(5) Sling use. Synthetic web slings illustrated in Figure D-6 shall not be used with loads in excess of the rated capacities specified in Tables D-20 through D-22. Slings not included in these tables shall be used only in accordance with the manufacturer's recommendations.

(6) Environmental conditions. When synthetic web slings are used, the following precautions shall be taken:

(a) Nylon web slings shall not be used where fumes, vapors, sprays, mists or liquids of acids or phenolics are present.

(b) Polyester and polypropylene web slings shall not be used where fumes, vapors, sprays, mists or liquids of caustics are present.

(c) Web slings with aluminum fittings shall not be used where fumes, vapors, sprays, mists or liquids of caustics are present.

(7) Safe operating temperatures. Synthetic web slings of polyester and nylon shall not be used at temperatures in excess of 180°F. Polypropylene web slings shall not be used at temperatures in excess of 200°F.

(8) Repairs.

(a) Synthetic web slings which are repaired shall not be used unless repaired by a sling manufacturer or an equivalent entity.

(b) Each repaired sling shall be proof tested by the manufacturer or equivalent entity to twice the rated capacity prior to its return to service. The employer shall retain a certificate of the proof test and make it available for examination.

(c) Slings, including webbing and fittings, which have been repaired in a temporary manner shall not be used.

(9) Removal from service. Synthetic web slings shall be immediately removed from service if any of the following conditions are present:

- (a) Acid or caustic burns;
- (b) Melting or charring of any part of the sling surface;
- (c) Snags, punctures, tears or cuts;
- (d) Broken or worn stitches; or
- (e) Distortion of fittings.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-760, filed 8/27/81.]

[Title 296 WAC—p. 1838]

WAC 296-78-765 Floor operated cranes. (1) An unobstructed aisle not less than three feet wide shall be maintained for travel of the operator except in such cases where the control handles are hung from the trolleys of traveling cranes.

(2) The controller or controllers, if rope operated, shall automatically return to the "off" position when released by the operator.

(3) Pushbuttons, in pendant stations, shall return to the "off" position when pressure is released by the crane operator.

(4) All pushbuttons shall be marked to indicate their purpose.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-765, filed 8/27/81.]

WAC 296-78-770 Operators. (1) Cranes shall be operated only by regular crane operators, authorized substitutes who have had adequate experience and training under the supervision of a competent operator, or by crane repair person or inspectors.

(2) No person under the age of eighteen years shall be permitted to operate a crane.

(3) Operators shall be required to pass a practical examination limited to the specific type of equipment to be operated. Operators shall meet the following physical qualifications:

(a) Have vision of at least 20/30 Snellen in one eye, and 20/50 in the other, with or without corrective lenses.

(b) Be able to distinguish red, green, and yellow, regardless of position of colors, if color differentiation is required for operation.

(c) Hearing, with or without hearing aid, must be adequate for the specific operation.

(d) A history of epilepsy or an uncorrected disabling heart condition shall be cause for a doctor decision to determine qualifications to operate a crane.

(4) Hands shall be kept free when going up and down ladders. Articles which are too large to go into pockets or belts shall be lifted to or lowered from the crane by hand line. (Except where stairways are provided.)

(5) Cages shall be kept free of clothing and other personal belongings. Tools, extra fuses, oil cans, waste and other articles necessary in the crane cage shall be stored in a tool box and not left loose on or about the crane.

(6) The operator shall familiarize himself fully with all crane rules and with the crane mechanism and its proper care. If adjustments or repairs are necessary, he shall report the same at once to the proper authority.

(7) The operator shall not eat, smoke or read while actually engaged in the operation of the crane.

(8) The operator or someone especially designated shall lubricate all working parts of the crane.

(9) Cranes shall be examined for loose parts or defects each day on which they are in use.

(10) Sawdust, oil or other debris shall not be allowed to accumulate to create a fire, health or slipping hazard.

(11) Operators shall avoid, as far as possible, carrying loads over workers. Loads shall not be carried over employees without sounding an audible warning alarm.

(1999 Ed.)

(12) Whenever the operator finds the main or emergency switch open, he shall not close it, even when starting on regular duty, until he has made sure that no one is on or about the crane. He shall not oil or repair the crane unless the main switch is open.

(13) If the power goes off, the operator shall immediately throw all controllers to "off" position until the power is again available.

(14) Before closing the main switch the operator shall make sure that all controllers are in "off" position until the power is again available.

(15) The operator shall pay special attention to the block, when long hitches are made, to avoid tripping the limit switch.

(16) The operator shall recognize signals only from the person who is supervising the lift except for emergency stop signals. Operating signals shall follow established standard crane signals as illustrated in WAC 296-78-830 of this chapter. Whistle signals may be used where one crane only is in operation. Cranes shall have audible warning device which shall be sounded in event of emergency.

(17) Before starting to hoist, the operator shall place the trolley directly over the load to avoid swinging it when being hoisted.

(18) The operator shall not make side pulls with the crane except when especially instructed to do so by the proper authority.

(19) When handling maximum loads, the operator shall test the hoist brakes after the load has been lifted a few inches. If the brakes do not hold, the load shall be lowered at once and the brakes adjusted or repaired.

(20) Bumping into runway stops or other cranes shall be avoided. When the operator is ordered to engage with or push other cranes, he shall do so with special care for the safety of persons on or below cranes.

(21) When lowering a load, the operator shall proceed carefully and make sure that he has the load under safe control.

(22) When leaving the cage the operator shall throw all controllers to "off" position and open the main switch.

(23) If the crane is located out of doors the operator shall lock the crane in a secure position to prevent it from being blown along or off the track by a severe wind.

(24) Railroad cars shall not be pulled along the tracks with sidepulls on an overhead crane.

(25) Operators shall not move the crane or a load unless floor signals are clearly understood.

(26) The rated lifting capacity of a crane shall not be exceeded. If any doubt exists about the weight of a load which might exceed the rated capacity, the foreman in charge must be contacted before any attempt is made to lift the load. The foreman shall determine that the load is within the rated capacity of the crane or the load shall not be lifted.

(27) Crane operators and floorpersons shall coordinate their activities on every lift or movement of the crane. Both the operator and signalperson shall clearly understand any problem a movement might create with regard to surrounding materials, structures, equipment or personnel.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-770, filed 8/27/81.]

(1999 Ed.)

WAC 296-78-775 Signalpersons. (1) Signalpersons shall give all the signals to the operator in accordance with established standard signals as illustrated in WAC 296-78-830 of this chapter.

(2) A designated person shall be responsible for the condition and use of all hoisting accessories and for all hitches.

(3) Before an operator moves a crane upon which an empty chain or cable sling is hanging, both ends of the sling shall be placed on the hook.

(4) Signalpersons, where necessary, shall walk ahead of the moving load and warn people to keep clear of it. They shall see that the load is carried high enough to clear all obstructions.

(5) Signalpersons shall notify the person in charge in advance when an extra heavy load is to be handled.

(6) No person shall be permitted to stand or pass under an electric magnet in use.

(7) The electrical circuit for electric magnets shall be maintained in good condition. Means for taking up the slack cable shall be provided.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-775, filed 8/27/81.]

WAC 296-78-780 Repairpersons. (1) When repairs are necessary, repairpersons shall have the crane run to a location where the repair work will least interfere with the other cranes and with operations on the floor.

(2) Before starting repairs, repairpersons shall see that all controllers are thrown to the "off" position, and that main or emergency switches are opened; one of these shall be locked out in compliance with WAC 296-78-715(11) of this chapter.

(3) Repairpersons shall immediately place warning signs or "Out of Order" signs on a crane to be repaired and also on the floor beneath or hanging from the crane so that it can easily be seen from the floor. If other cranes are operated on the same runway, repairpersons shall also place rail stops at a safe distance or make other safe provisions.

(4) When repairing runways, repairpersons shall place rail stops and warning signs or signals so as to protect both ends of the section to be repaired.

(5) Repairpersons shall take care to prevent loose parts from falling or being thrown upon the floor beneath.

(6) Repairs shall not be considered complete until all guards and safety devices have been put in place and the block and tackle and other loose material have been removed.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-780, filed 8/27/81.]

WAC 296-78-785 Construction requirements. (1) Calculations for wind pressure on outside overhead traveling cranes shall be based on not less than 30 pounds per square foot of exposed surface.

(2) No overhung gears shall be used unless provided with an effective means of keeping them in place, and keys shall be secured to prevent gears working loose.

Safety lugs or brackets shall be provided on the trolley frames and bridge ends of overhead traveling cranes, so that in the event of a broken axle or wheel the trolley or bridge proper will not have a drop greater than one inch.

(3) Where there are no members over an outside overhead crane suitable for attaching blocks for repair work, and

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a locomotive crane is not available, a structural steel outrigger of sufficient strength to lift the heaviest part of the trolley shall be provided.

(4) Outside overhead traveling cranes shall be equipped with wind indicators and rail clamps as required by the general safety and health standards, WAC 296-24-23503.

(5) Foot brakes, or other effective means shall be provided to control the bridge travel of all overhead traveling cranes.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-785, filed 8/27/81.]

WAC 296-78-790 Crane platforms and footwalks. (1) Platforms shall be provided when changing and repairing truck wheels on end trucks.

(2) A platform or footwalk shall be located on crane or crane runway to give access to the crane cage, and it shall be accessible from one or more stairways or fixed ladders. This platform or footwalk shall be not less than eighteen inches in width.

(3) Where stairways are used to give access to platforms they shall make an angle of not more than fifty degrees with the horizontal and shall be equipped with substantial railing. If ladders are used to give access to platforms they shall extend not less than thirty-six inches above the platform. Railed stairways or ladders to be used as a means of ingress and egress to crane cages shall be located at either or both ends.

(4) A footwalk shall be placed along the entire length of the bridge on the motor side, and a short platform twice the length of the trolley placed at one end of the girder on the opposite side, with a vertical clearance of a least six feet six inches where the design of crane or building permits, but in no case shall there be less than four feet clearance. For hand operated cranes the footwalk shall not be required to be installed on the bridge of the crane, but there shall be a repair platform equal in strength and design to that required for motor operated cranes, installed on the wall of the building or supported by the crane runway at a height equal to the lower edge of the bridge girder to facilitate necessary repairs.

(5) Clear width of footwalks shall not be less than eighteen inches except around the bridge motor where it may be reduced to fifteen inches.

(6) Footwalks shall be of substantial construction and rigidly braced. Footwalks for outside service shall be constructed so as to provide proper drainage, but the cracks between the boards shall not be wider than one-fourth inch.

(7) Every footwalk shall have a standard railing and toeboard at all exposed edges. Railings and toeboards shall conform in construction and design with the following requirements:

(a) Railings shall be not less than thirty-six inches nor more than forty-two inches in height, with an additional rail midway between the top rail and the floor.

(b) Pipe railings shall be not less than one and one-fourth inch inside diameter if of iron or be not less than one and one-half inches outside diameter if of brass tubing.

(c) Metal rails other than pipe shall be at least equal in strength to that of one and one-half by three-sixteenths inch angle and shall be supported by uprights of equal strength.

(d) Posts or uprights shall be spaced not more than eight feet center to center.

(e) Toeboards shall be not less than four inches in height.

(f) Toeboards shall be constructed in a permanent and substantial manner of metal, wood, or other material equivalent thereto in strength. Where of wood, toeboards shall be at least equal in cross section to one inch by four inches; where of steel at least one-eighth inch by four inches; where of other construction at least equal to the requirements for steel. Perforations up to one-half inch are permissible in metal toeboards.

(8) No openings shall be permitted between the bridge footwalk and the crane girders. Where wire mesh is used to fill this opening the mesh openings shall be not greater than one-half inch.

(9) All footwalks and platforms shall be so designed as to be capable of sustaining a concentrated load of one hundred pounds per lineal foot.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-790, filed 8/27/81.]

WAC 296-78-795 Crane cages. (1) Safe means of escape shall be provided for operators of all cranes in all operating locations. Rope ladders shall not be used as a regular means of access but may be installed as an emergency escape device to be used in the event of fire, mechanical breakdown or other emergency.

(2) The operator's cage shall be located at a place from which signals can be clearly distinguishable, and shall be securely fastened in a place and well braced to minimize vibration. It shall be large enough to allow ample room for the control equipment and the operator. The operator shall not be required to step over an open space of more than eighteen inches when entering the cage.

(3) Cab operated cranes shall be equipped with a portable fire extinguisher which meets the requirements of the general safety and health standard, WAC 296-24-590 through 296-24-59007.

(4) In establishments where continuous loud noises prevail such as caused by the operation of pneumatic tools, steam exhausts from boilers, etc., adequate signals shall be installed on cranes or one or more employees shall be placed on the floor for each crane operated to give warning to other employees of the approach of a crane with a load. Where there are more than two cranes on the same runway or within the same building structure, signaling devices are required to give warning to other employees of the approach of a crane with a load.

(5) Cages of cranes subjected to heat from below shall be of noncombustible construction and shall have a steel plate shield not less than one-eighth inch thick, placed not less than six inches below the bottom of the floor of the cage.

(6) Outside crane cages shall be enclosed. There shall be windows on three sides of the cage. The windows in the front and the side opposite the door shall be the full width of the cage.

(7) The floor of the cage on out-door cranes shall be extended to form an entrance landing which shall be equipped with a handrail and toeboard constructed to the specifications of WAC 296-78-790 of this chapter.

(8) A copy of the rules for operators shall be permanently posted in the cages of all cage-operated cranes.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-795, filed 8/27/81.]

WAC 296-78-800 Crane rail stops, bumpers and fenders. (1) Rail stops shall be provided at both ends of the crane runway and at ends of the crane bridge. When two trolleys are operated on the same bridge rails, bumpers shall be provided to prevent collision of trolleys.

(2) Bumpers and rail stops shall extend at least as high as the centers of the wheel.

(3) Rail stops shall be fastened to the girders or girders and rails, but not to the rails alone. This does not apply to portable rail stops. Portable rail stops shall not be used as permanent rail stops.

(4) Rail stops shall be built up of plates and angles or be made of cast steel.

(5) Fenders shall be installed which extend below the lowest point of the treads of gantry type crane wheels. They shall be of a shape and form that will tend to push or raise an employee's hand, arm or leg off the rail and away from the wheel.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-800, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-800, filed 8/27/81.]

WAC 296-78-805 Crawler locomotive and truck cranes. Crawler locomotive and truck cranes shall be constructed, maintained, inspected and operated in accordance with the provisions of WAC 296-24-240 through 296-24-24019 of the general safety and health standards.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-805, filed 8/27/81.]

WAC 296-78-810 Chain and electric hoists. (1) Chain and electric hoists shall be of what is known as "all steel construction." No cast iron shall be used in parts subject to tension except drums, bearings or brake shoes.

(2) The chains shall be made of the best quality steel or iron with welded links.

(3) Chain and electric hoists shall have a factor of safety of at least five.

(4) Chain and electric hoists shall be equipped with a device which will automatically lock the load when hoisting is stopped.

(5) Electric hoists shall be provided with a limit stop to prevent the hoist block from traveling too far in case the operating handle is not released in time.

(6) Workers shall not ride the load of any chain or electric hoist. If necessary to balance the load manually, it shall be done from a safe distance.

(7) The rated capacity of the hoist shall be posted on both the hoist and the jib or rail.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-810, filed 8/27/81.]

WAC 296-78-815 Monorail hoists. (1) No attempt shall be made with a monorail hoist to lift or move an object by a side pull, unless designed for that purpose.

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(2) A stop shall be provided at all switches and turntables which will prevent the trolley from running off should the switch be turned or be left in the open position.

(3) All monorail hoists operating on swivels shall be equipped with one or more safety catches which will support the load should a suspension pin fail. All trolley frames shall be safeguarded against spreading.

(4) Rail stops shall be provided at the ends of crane runways. Such rail stops shall extend at least as high as the centers of the wheels.

(5) All monorail hoists shall have the rated capacity posted on both the hoist and the rail.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-815, filed 8/27/81.]

WAC 296-78-820 Air hoists. (1) To prevent piston rod lock nuts from becoming loose and allowing rod to drop when supporting a load, lock nut shall be secured to piston rod by a castellated nut and cotter-pin.

(2) A clevis, "D" strap or other means shall be used to prevent the hoist cylinder becoming detached from the hanger.

(3) All air hoists shall have their rated capacity posted on both the hoist and the jib or rail.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-820, filed 8/27/81.]

WAC 296-78-825 Jib, pillar, and portable floor cranes, crabs, and winches. (1) Side pulls shall not be made with jib or pillar cranes. The arm or boom shall be directly over the load when making a lift.

(2) The gears of all cranes shall be enclosed, and if hand operated by means of a crab or winch, a locking dog shall be provided to hold load when the handle is released.

(3) Some form of brake or safety lowering device shall be provided on all crabs, winches, and jib cranes.

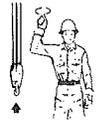
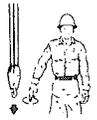
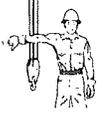
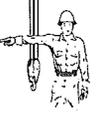
(4) A hoist limiting device shall be provided on all jib cranes of ten or more tons capacity.

(5) The rated capacity of the hoisting device shall be posted on the hoist and the arm or boom.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-825, filed 8/27/81.]

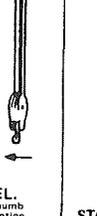
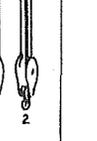
WAC 296-78-830 Standard crane hand signals—Illustrations. (1) The following hand signals shall be used for crawler, locomotive, and truck cranes and a copy shall be posted in the cab at the operator's station.

CRAWLER, LOCOMOTIVE, AND TRUCK CRANES

				
HOIST. With forearm vertical, forefinger pointing up, move hand in small horizontal circle.	LOWER. With arm extended downward, forefinger pointing down, move hand in small horizontal circles.	USE MAIN HOIST. Tap hat on head; then use regular signals.	USE WHIPLINE (Auxiliary Hoist). Tap elbow with one hand; then use regular signals.	RAISE BOOM. Arm extended, fingers closed, thumb pointing upward.
				
LOWER BOOM. Arm extended, fingers closed, thumb pointing downward.	MOVE SLOWLY. Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example.)	RAISE THE BOOM AND LOWER THE LOAD. With arm extended, thumb pointing up, use fingers in and out as long as load movement is desired.	LOWER THE BOOM AND RAISE THE LOAD. With arm extended, thumb pointing down, use fingers in and out as long as load movement is desired.	SWING. Arm extended, point with finger in direction of swing of boom.
				
STOP. Arm extended, palm down, hold position rigidly.	EMERGENCY STOP. Arm extended, palm down, move hand rapidly right and left.	TRAVEL. Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.	DOG EVERYTHING. Clasp hands in front of body.	TRAVEL (Both Tracks). Use both fists in front of body, making a circular motion about each other, indicating direction of travel, forward or backward. (For crawler cranes only.)
				
TRAVEL (One Track). Lock the track on side indicated by raised fist. Travel opposite track in direction indicated by circular motion of other fist, rotated vertically in front of body. (For crawler cranes only.)	EXTEND BOOM (Telescoping Booms). Both fists in front of body with thumbs pointing outward.	RETRACT BOOM (Telescoping Booms). Both fists in front of body with thumbs pointing toward each other.	EXTEND BOOM (Telescoping Booms). One Hand Signal. One fist in front of chest with thumb tapping chest.	RETRACT BOOM (Telescoping Booms). One Hand Signal. One fist in front of chest, thumb pointing outward and heel of fist tapping chest.

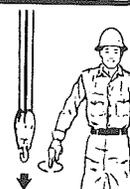
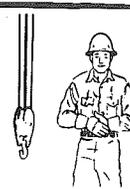
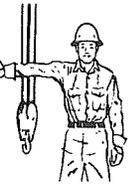
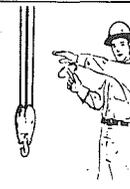
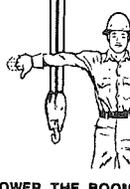
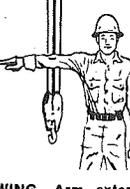
(2) The following hand signals shall be used for overhead and gantry cranes and a copy shall be posted in the cab at the operator's station.

STANDARD HAND SIGNALS FOR CONTROLLING OVERHEAD AND GANTRY CRANES

		
HOIST. With forearm vertical, forefinger pointing up, move hand in small horizontal circle.	LOWER. With arm extended downward, forefinger pointing down, move hand in small horizontal circles.	BRIDGE TRAVEL. Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.
		
TROLLEY TRAVEL. Palm up, fingers closed, thumb pointing in direction of motion, jerk hand horizontally.	STOP. Arm extended, palm down, move arm back and forth.	EMERGENCY STOP. Both arms extended, palms down, move arms back and forth.
		
MULTIPLE TROLLEYS. Hold up one finger for block marked "1" and two fingers for block marked "2". Regular signals follow.	MOVE SLOWLY. Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example.)	MAGNET IS DISCONNECTED. Crane operator spreads both hands apart, palms up.

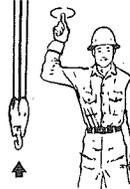
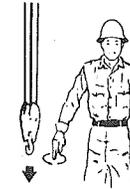
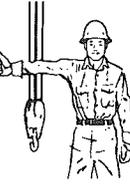
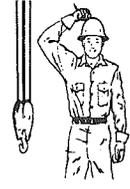
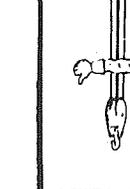
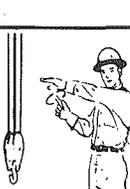
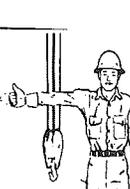
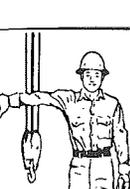
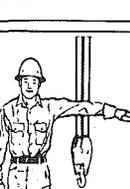
(3) The following hand signals shall be used for derricks and a copy shall be posted in the cab at the operator's station.

STANDARD HAND SIGNALS FOR CONTROLLING DERRICKS

 <p>HOIST. With forearm vertical, forefinger pointing up, move hand in small horizontal circle.</p>	 <p>LOWER. With arm extended downward, forefinger pointing down, move hand in small horizontal circles.</p>	 <p>DOG EVERYTHING. Clasp hands in front of body.</p>
 <p>RAISE BOOM. Arm extended, fingers closed, thumb pointing upward.</p>	 <p>LOWER BOOM. Arm extended, fingers closed, thumb pointing downward.</p>	 <p>MOVE SLOWLY. Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example.)</p>
 <p>RAISE THE BOOM AND LOWER THE LOAD. With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.</p>	 <p>LOWER THE BOOM AND RAISE THE LOAD. With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.</p>	 <p>SWING. Arm extended, point with finger in direction of swing of boom.</p>
 <p>STOP. Arm extended, palm down, hold position rigidly.</p>	 <p>EMERGENCY STOP. Arm extended, palm down, move hand rapidly right and left.</p>	

(4) The following hand signals shall be used for portal, tower, and pillar cranes and a copy shall be posted in the cab at the operator's station.

STANDARD HAND SIGNALS FOR CONTROLLING PORTAL, TOWER AND PILLAR CRANES

 <p>HOIST. With forearm vertical, forefinger pointing up, move hand in small horizontal circle.</p>	 <p>LOWER. With arm extended downward, forefinger pointing down, move hand in small horizontal circles.</p>	 <p>USE WHIPLINE (Auxiliary Hoist). Tap elbow with one hand; then use regular signals.</p>
 <p>RAISE BOOM. Arm extended, fingers closed, thumb pointing upward.</p>	 <p>USE MAIN HOIST. Tap fist on head; then use regular signals.</p>	 <p>EXTEND BOOM (Telescoping Boom). One Hand Signal. One flat in front of chest with thumb tapping chest.</p>
 <p>LOWER BOOM. Arm extended, fingers closed, thumb pointing downward.</p>		 <p>DOG EVERYTHING. Clasp hands in front of body.</p>
 <p>MOVE SLOWLY. Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example.)</p>	 <p>RAISE THE BOOM AND LOWER THE LOAD. With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.</p>	 <p>LOWER THE BOOM AND RAISE THE LOAD. With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.</p>
 <p>SWING. Arm extended, point with finger in direction of swing of boom.</p>	 <p>STOP. Arm extended, palm down, hold position rigidly.</p>	 <p>EMERGENCY STOP. Arm extended, palm down, move hand rapidly right and left.</p>

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-830, filed 8/27/81.]

WAC 296-78-835 Vehicles. (1) Vehicles.

(a) Scope. Vehicles shall include all mobile equipment normally used in sawmill, planing mill, storage, shipping, and yard operations, including log sorting yards.

(b) Lift trucks. Lift truck shall be designed, constructed, maintained and operated in accordance with the requirements of WAC 296-24-230 through 296-24-23035 of the general safety and health standards.

(c) Carriers. Drive chains on lumber carriers shall be adequately guarded to prevent contact at the pinch points.

(d)(i) Lumber carriers shall be so designed and constructed that the operator's field of vision shall not be unnecessarily restricted.

(ii) Carriers shall be provided with ladders or equivalent means of access to the operator's platform or cab.

(e) Lumber hauling trucks.

(i) On trucks where the normal operating position is ahead of the load in the direction of travel, the cab shall be protected by a barrier at least as high as the cab. The barrier shall be capable of stopping the weight of the load capacity of the vehicle if the vehicle were to be stopped suddenly while traveling at its normal operating speed. The barrier shall be constructed in such a manner that individual pieces of a normal load will not go through openings in the barrier.

(ii) Stakes, stake pockets, racks, tighteners, and binders shall provide a positive means to secure the load against any movement during transit.

(iii) Where rollers are used, at least two shall be equipped with locks which shall be locked when supporting loads during transit.

(2) Warning signals and spark arrestors. All vehicles shall be equipped with audible warning signals and where practicable shall have spark arrestors.

(3) Flywheels, gears, sprockets and chains and other exposed parts that constitute a hazard to workers shall be enclosed in standard guards.

(4) All vehicles operated after dark or in any area of reduced visibility shall be equipped with head lights and backup lights which adequately illuminate the direction of travel for the normal operating speed of the vehicle. The vehicle shall also be equipped with tail lights which are visible enough to give sufficient warning to surrounding traffic at the normal traffic operating speed.

(5) All vehicles operated in areas where overhead hazards exist shall be equipped with an overhead guard for the protection of the operator.

(6) Where vehicles are so constructed and operated that there is a possibility of the operator being injured by backing into objects, a platform guard shall be provided and so arranged as not to hinder the exit of the driver.

(7) Trucks, lift trucks and carriers shall not be operated at excessive rates of speed. When operating on tramways or docks more than six feet above the ground or lower level they shall be limited to a speed of not more than twelve miles per hour. When approaching blind corners they shall be limited to four miles per hour.

(8) Vehicles shall not be routed across principal thoroughfares while employees are going to or from work unless pedestrian lanes are provided.

(a) Railroad tracks and other hazardous crossings shall be plainly posted and traffic control devices (American National Standard D8.1 - 1967 for Railroad-Highway Grade Crossing Protection) should be utilized.

(b) Restricted overhead clearance. All areas of restricted side or overhead clearance shall be plainly marked.

(c) Pickup and unloading points. Pickup and unloading points and paths for lumber packages on conveyors and transfers and other areas where accurate spotting is required, shall be plainly marked and wheel stops provided where necessary.

(d) Aisles, passageways, and roadways. Aisles, passageways, and roadways shall be sufficiently wide to provide safe side clearance. One-way aisles may be used for two-way traffic if suitable turnouts are provided.

(9) Where an operator's vision is impaired by the vehicle or load it is carrying, he shall move only on signal from someone so stationed as to have a clear view in the direction the vehicle is to travel.

(10) Lift trucks shall be equipped, maintained and operated in compliance with the requirements of the general safety and health standard, WAC 296-24-230 through 296-24-23035.

(11) Load limits. No vehicle shall be operated with loads exceeding its safe load capacity.

(12) Vehicles with internal combustion engines shall not be operated in enclosed buildings or buildings with ceilings less than sixteen feet high unless the buildings have ventilation adequate to maintain air quality as required by the general occupational health standard, chapter 296-62 WAC.

(13) Vehicles shall not be refueled while motor is running. Smoking or open flames shall not be allowed in the refueling area.

(14) No employee other than trained operators or mechanics shall start the motor of, or operate any log or lumber handling vehicle.

(15) All vehicles shall be equipped with brakes capable of holding and controlling the vehicle and capacity load upon any grade or incline over which they may operate.

(16) Unloading equipment and facilities.

(a) Machines used for hoisting, unloading, or lowering logs shall be equipped with brakes capable of controlling or holding the maximum load in midair.

(b) The lifting cylinders of all hydraulically operated log handling machines, where the load is lifted by wire rope, shall be equipped with a positive device for preventing the uncontrolled lowering of the load or forks in case of a failure in the hydraulic system.

(c) A limit switch shall be installed on powered log handling machines to prevent the lift arms from traveling too far in the event the control switch is not released in time.

(d) When forklift-type machines are used to load trailers, a means of securing the loading attachment to the fork shall be installed and used.

(e) A-frames and similar log unloading devices shall have adequate height to provide safe clearance for swinging loads and to provide for adequate crotch lines and spreader bar devices.

(f) Log handling machines used to stack logs or lift loads above operator's head shall be equipped with overhead protection.

(g) Unloading devices shall be equipped with a horn or other plainly audible signaling device.

(h) Movement of unloading equipment shall be coordinated by audible or hand signals when operator's vision is impaired or operating in the vicinity of other employees.

Lift trucks regularly used for transporting peeler blocks or cores shall have tusks or a similar type hold down device to prevent the blocks or cores from rolling off the forks.

(17) Where spinners are used on steering wheels, they shall be of the automatic retracting type or shall be built into the wheel in such a manner as not to extend above the plane surface of the wheel. Vehicles equipped with positive anti-kickback steering are exempted from this requirement.

(18) Mechanical stackers and unstackers shall have all gears, sprockets and chains exposed to the contact of workers, fully enclosed by guards as required by WAC 296-78-710 of this chapter.

(19) Manually operated control switches shall be properly identified and so located as to be readily accessible to the operator. Main control switches shall be so designed that they can be locked in the open position.

(20) Employees shall not stand or walk under loads being lifted or moved. Means shall be provided to positively block the hoisting platform when employees must go beneath the stacker or unstacker hoist.

(21) No person shall ride any lift truck or lumber carrier unless a suitable seat is provided, except for training purposes.

(22) Unstacking machines shall be provided with a stopping device which shall at all times be accessible to at least one employee working on the machine.

(23) Floor of unstacker shall be kept free of broken stickers and other debris. A bin or frame shall be provided to allow for an orderly storage of stickers.

(24) Drags or other approved devices shall be provided to prevent lumber from running down on graders.

(25) Liquefied petroleum gas storage and handling. Storage and handling of liquefied petroleum gas shall be in accordance with the requirements of WAC 296-24-475 through 296-24-47517 of the general safety and health standards.

(26) Flammable liquids. Flammable liquids shall be stored and handled in accordance with WAC 296-24-330 through 296-24-33019 of the general safety and health standards.

(27) Guarding side openings. The hoistway side openings at the top level of the stacker and unstacker shall be protected by enclosures of standard railings.

(28) Guarding hoistway openings. When the hoist platform or top of the load is below the working platform, the hoistway openings shall be guarded.

(29) Guarding lower landing area. The lower landing area of stackers and unstackers shall be guarded by enclosures that prevent entrance to the area or pit below the hoist platform. Entrances should be protected by electrically interlocked gates which, when open, will disconnect the power and set the hoist brakes. When the interlock is not installed,

other positive means of protecting the entrance shall be provided.

(30) Lumber lifting devices. Lumber lifting devices on all stackers shall be designed and arranged so as to minimize the possibility of lumber falling from such devices.

(31) Inspection. At the start of each work shift, equipment operators shall inspect the equipment they will use for evidence of failure or incipient failure. Equipment found to have defects which might affect the operating safety shall not be used until the defects are corrected.

(32) Cleaning pits. Safe means of entrance and exit shall be provided to permit cleaning of pits.

(33) Preventing entry to hazardous area. Where the return of trucks from unstacker to stacker is by mechanical power or gravity, adequate signs, warning devices, or barriers shall be erected to prevent entry into the hazardous area.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-835, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-835, filed 8/27/81.]

WAC 296-78-840 Loading, piling, storage and conveying.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-840, filed 8/27/81.]

WAC 296-78-84001 Loading, piling, storage and conveying—General. (1) Units or loads of lumber built up for transportation by overhead cranes, lift trucks, auto trucks, or manually or mechanically operated transfers shall be provided with at least one set of stickers for each eighteen inches in height of unit or load. One set of stickers shall be not more than six inches from the top of units of lumber up to three inch dimension. Where dimension of material is greater than three inches, a set of stickers shall be placed under the top layer. Stickers shall extend the full width of the package, shall be uniformly spaced, and shall be aligned one above the other. Stickers may be lapped with a minimum overlapping of twelve inches. Stickers shall not protrude more than two inches beyond the sides of the package.

(2) Lumber loading. Loads shall be built and secured to insure stability in transit.

(3) Units or loads of lumber shall not be lifted or moved until all workers are in the clear.

(4) Gradient of roll sets or roll cases over which units of lumber are to be moved shall not exceed three percent. The movement of units shall be under control at all times.

(5) Stacking of lumber in yards, either by units or in block piles, shall be conducted in a safe and orderly manner.

(6) Foundations for piling lumber in yards shall be capable of supporting the maximum applied load without tipping or sagging.

(7) The height of stacked units in storage areas shall not exceed seven of the usual four foot units, subject to the following qualifications:

(a) Units of lumber shall not be stacked more than four high unless two or more stacks of units are tied together with ties.

(b) Long units of lumber shall not be stacked upon shorter packages except where a stable pile can be made with the use of package separators.

(c) In unit package piles, substantial polsters or unit separators shall be placed between each package directly over the stickers.

(8) Wooden horses used for loading preformed loads of lumber shall be of material not less than four by six inches in cross section net measure.

(9) Unstable piles. Piles of lumber which have become unstable shall be immediately made stable or removed.

(10) Lift boards or pallets shall be loaded in such a manner as to prevent material from spilling or the material shall be secured with a binder.

(11) Packing rooms shall be kept free of debris and chutes shall be equipped with a means of slowing down the materials.

(12) Sorting chains shall be provided with a stopping device which shall at all times be readily accessible to at least one employee working on the chain.

(13) The inside of the walkway of all green chains and sorting tables shall be provided with a standard toeboard.

(14) Rollers or other devices shall be provided for removing heavy dimension lumber from the cabin or table.

(15) Roll casings and transfer tables shall be cleaned regularly and shall be kept reasonably free from debris.

(16) In all permanent installations, green chains and sorting tables shall be roofed over to provide protection from inclement weather. Normal work stations shall be provided with a drained work surface which is evenly floored of non-slip material.

(17) Power driven rolls shall be operated in a manner to prevent end collisions.

(18) The space between live rolls shall be filled in on either side of crosswalks with material of structural strength to withstand the load imposed with a four to one safety factor.

(19) The driving mechanism of live rolls shall be guarded wherever exposed to contact.

(20) Live rolls shall be replaced when their surface develops a break or hole.

(21) Guarding. Spiked live rolls shall be guarded.

(22) Ramps or skidways used to transfer lumber or materials from one level to another shall be provided with all safeguards necessary for the protection of workers.

(23) Landings on a lower level where lumber or timbers are discharged over ramps or skidways shall be provided with a solid bumper not less than six inches in height at the outer edge. Such landing shall be maintained in good repair at all times.

(24) Ramps or skidways shall be so arranged that the person putting lumber down shall have a clear view of the lower landing. Lumber or timbers shall not be put down until all workers are in the clear.

(25)(a) The under face of all ramp or skidway landings shall be fenced off or other positive means provided to prevent persons from walking out under dropping timber.

(b) Return strands of sorting table ramp chains shall be supported by troughs of sufficient strength to support the weight of a broken chain.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-84001, filed 8/27/81.]

[Title 296 WAC—p. 1846]

WAC 296-78-84003 Conveyors. (1) Construction, operation, and maintenance of conveyors shall be in accordance with American National Standard B20.1 - 1957, Safety Code for Conveyors, Cableways and related equipment.

(2) Conveyor troughs in which the working strands of a conveyor operate shall be of ample dimension and strength to carry a broken chain and shall afford effective protection to all employees.

(3) When the return strand of a conveyor operates within seven feet of the floor there shall be a trough provided of sufficient strength to carry the weight resulting from a broken chain.

(4) When the return strands of a conveyor pass over passageways or work areas such guards shall be placed under them as will effectively protect workers.

(5) When the working strand of a conveyor crosses within three feet of the floor level in passageways, the trough in which it works shall be bridged the full width of the passageway.

(6) Where conveyor, idler pulleys or other equipment is located over or dangerously near burning refuse, any worker going to such location shall use a safety line which shall be securely fastened to his body and tended by a helper.

(7) Conveyors shall be provided with an emergency panic-type stopping device which can be reached by a person in a sitting position on the conveyor. Such device shall be located near the material entrance to each barker, chipper, hog, saw, or similar type of equipment except where the conveyor leading into such equipment is under constant control of an operator who has full view of the material entrance and is located or restrained where he/she cannot possibly fall onto the conveyor. The device shall stop the conveyor a sufficient distance away from the hazard to prevent injury or further injury by the hazard.

(8) Screw or auger type conveyor troughs and boxes shall be equipped with covers. If it is not practical to cover the troughs or boxes, other equivalent type guards shall be provided.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-84003, filed 8/27/81.]

WAC 296-78-84005 Dry kilns. (1) Transfer, kiln and dolly tracks shall be properly maintained at all times and shall have a grade of not more than one and one-fourth percent. Bumpers or stops shall be installed at the ends of all tracks capable of stopping a normal load for which the track is installed. A means shall be provided for chocking or blocking cars.

(2) Doors.

(a) Main kiln doors. Main kiln doors shall be provided with a method of holding them open while kiln is being loaded.

(b) Counterweights on vertical lift doors shall be boxed or otherwise guarded.

(c) Means shall be provided to firmly secure main doors, when they are disengaged from carriers and hangers, to prevent toppling.

(3) Kilns whose operation requires inside inspection shall be maintained with not less than eighteen inches clearance between loaded cars and the walls of the kiln. The

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requirements for personal protective equipment specified in chapter 296-24 WAC, Part A-2, general safety and health standards, and chapter 296-62 WAC, Part E, general occupational health standards, shall be complied with.

(4) Kiln loads shall be equipped or arranged for easy attachment and detachment of transfer cables. Means for stopping kiln cars shall be available at all times.

(5) Cars shall not be moved until tracks are clear and workers are out of the bight of transfer lines.

(6) When kiln or dolly loads of lumber are permitted to coast through or adjacent to any work area, audible warning shall be given.

(7) Stickers shall not be allowed to protrude more than two inches from the sides of kiln stacks.

(8) Yards and storage areas shall be kept reasonably free of debris and unnecessary obstruction. Warning signs shall be conspicuously posted wherever there is danger from moving vehicles or equipment.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-84005, filed 8/20/96, effective 10/15/96; 94-20-057 (Order 94-16), § 296-78-84005, filed 9/30/94, effective 11/20/94. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-84005, filed 8/27/81.]

WAC 296-78-84007 Chippers and hogs. (1) Chippers. The feed system to the chipper shall be arranged so the operator does not stand in direct line with the chipper spout (hopper). The chipper spout shall be enclosed to a height or distance of not less than forty inches from the floor or the operator's station. A safety belt and lifeline shall be worn by workers when working at or near the spout unless the spout is guarded. The lifeline shall be short enough to prevent workers from falling into the chipper.

(2) Hog mills shall be provided with feed chutes so designed and arranged that from no position on the rim of the chute shall the distance to the knives or feed roll be less than forty inches. Baffles shall be provided which shall effectively prevent material from being thrown from the mill.

(3) Employees feeding hog mills shall be provided with safety belts and lines, which they shall be required to use at all times, unless otherwise protected from any possibility of falling into the mill.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-78-84007, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-84007, filed 8/27/81.]

WAC 296-78-84009 Bins and bunkers. (1) Bins, bunkers, hoppers, and fuel houses. Guarding. Open bins, bunkers, and hoppers whose upper edges extend less than three feet above working level shall be equipped with standard handrails and toeboards, or have their tops covered by a substantial grill or grating with openings small enough to prevent a person from falling through.

(2) Fuel hoppers shall be provided with doors that may be remotely operated.

(3) Fuel hoppers shall be provided with platforms with standard railings and adequately lighted for the protection of workers taking out fuel.

(4)(a) Fuel bins shall be provided with an approved railed platform or walkway near the top or other approved means, for the use of employees engaged in dislodging con-

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gested fuel. No employee shall enter any fuel bin except where adequately safeguarded.

(b) Recognizing however, the varying designs of fuel storage vaults and the type of fuel handled and certain peculiar local conditions, the adequacy of safety devices shall be determined by a duly authorized representative of the department of labor and industries, division of industrial safety and health.

(c) During operations when the flow of normal fuel is interrupted but dust from operating sanders is received in the bin, workers shall not enter the fuel bin until the flow of sander dust has been discontinued and the dust has settled.

(d) Use of wheeled equipment to load bins. Where automotive or other wheeled equipment is used to move materials into bins, bunkers, and hoppers, adequate guard rails shall be installed along each side of the runway, and a substantial bumper stop provided when necessary.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-84009, filed 8/27/81.]

WAC 296-78-84011 Burners. (1) Burners and smoke stacks other than the self-supporting type shall be adequately guyed. Buckle guys shall be installed if burner or stack is more than fifty feet in height.

(2) Runway. The conveyor runway to the burner shall be equipped with a standard handrail. If the runway crosses a roadway or thoroughfare, standard toeboards shall be provided in addition.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-84011, filed 8/27/81.]

Chapter 296-79 WAC

SAFETY STANDARDS FOR PULP, PAPER, AND PAPERBOARD MILLS AND CONVERTERS

WAC

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WAC 296-79-010 Scope and application. (1) This chapter applies to establishments, firms, persons and corporations dealing with the manufacturing, processing, storing, finishing or converting of pulp, paper or paperboard and all buildings, machinery and equipment pertaining thereto.

(2) This chapter shall augment the Washington state general safety and health standards, general occupational health standards, electrical workers safety rules, and any other standards which are applicable to all industries governed by chapter 80, Laws of 1973 (chapter 49.17 RCW), Washington Industrial Safety and Health Act. In the event of any conflict between any portion of this chapter and any portion of any of the general application standards, the provisions of this chapter 296-79 WAC, shall apply.

(3) When the words "shall" or "must" are used in this chapter, the requirement is compulsory. The words "may" or "should," as used in this standard, identify recommendations or suggestions only.

(4) The rules contained in this chapter are minimum requirements and the use of additional guards, or other means, methods or procedures may be needed in order to make the work or place of work safe.

[Order 74-24, § 296-79-010, filed 5/6/74; Order 70-6, § 296-79-010, filed 7/10/70, effective 8/10/70.]

WAC 296-79-020 General requirements. (1) House-keeping. Floors shall be kept reasonably clear of spilled or leaking oil, grease, water, broke, etc., that may cause slipping, tripping or falling. Nonskid type surfacing shall be installed in vehicular or pedestrian traffic areas in which slipping hazards otherwise would exist.

In areas where it is not possible to keep the floor free of materials which cause a slipping hazard, mats, cleats, or other suitable materials which will effectively minimize or eliminate the hazard shall be installed.

(2) Storage of hoses, cords, slings or similar items or equipment. Hoses, cords, slings or similar items or equipment shall be stored in such a manner that they will not create a hazard.

(3) Storage and transportation of materials. Materials, objects or equipment shall be stored or transported by use of means or methods which will prevent them from falling, tipping or rolling.

(4) Compressed gas cylinders. Compressed gas cylinders shall be stored away from heat sources, combustible materials or other materials which may cause hazardous conditions. Storage facilities shall comply with the requirements of the general safety and health standards, chapter 296-24 WAC. Cylinders shall be secured in a manner which will prevent them from tipping or falling. Acetylene cylinders shall be stored, transported, or used while in the upright position only.

(5) Warning of obstructions. Open manholes or excavations shall be roped off, barricaded, or adequately safeguarded by an approved method when located in or adjacent to walkways, aiseways, or roadways. During periods of darkness or reduced visibility, such areas shall be provided with warning lights or lanterns.

(6) Employees to be instructed. Employees shall not be permitted to operate any machine or equipment until they have received proper instruction and are familiar with safe operating procedures.

(7) Training personnel to handle emergencies. In each area where hazardous substances may be encountered, personnel shall be trained to cope with emergencies arising from breaks, ruptures, or spills which would create a hazardous condition.

(8) Working alone. When an employee is assigned to work alone in a remote or isolated area, a system shall be instituted whereby such employee reports by use of radio or telephone to someone periodically or a designated person shall check on his safety at reasonable intervals. All persons involved in working alone shall be advised of the procedures to be followed.

(9) Lifting or moving objects. Employees shall be instructed in proper lifting or moving techniques and methods. Mechanical devices should be used or employees should ask for assistance in lifting or moving heavy objects.

(10) Reporting hazards. Any faulty equipment or hazardous condition shall be promptly reported to the person in charge.

(11) Exits from hazardous areas. Where physically and reasonably possible, there shall be at least two unobstructed exits from any hazardous area. Such exits shall preferably be on opposite walls.

(12) Safe work area. Sufficient clearance shall be maintained between machines to allow employees a safe work area.

(13) Protection from overhead hazard. Warning signs shall be placed in conspicuous locations below areas where overhead work is being done and shall be removed promptly when work is completed.

(14) Welding areas protected. Areas in which welding is being done shall be screened or barricaded to protect persons from flash burns, when practical. If the welding process cannot be isolated, all persons who may be exposed to the hazard of arc flash shall be properly protected.

(15) Testing safety devices. Brakes, back stops, anti-run-away devices, overload releases and other safety devices shall be inspected and tested frequently to ensure that all are operative and maintained in good repair.

(16) Starting and stopping devices. Electrically or manually operated power disconnecting devices shall be provided within easy reach of the operator while in his normal operating position. If necessary for safety of the operation, the machine shall be so equipped that retarding or braking action can be applied at the time of or after the source of power is deactivated.

(17) Use of compressed air for cleaning purposes. Compressed air shall not be used for cleaning purposes if it may endanger other persons in the area or for cleaning clothing while it is being worn.

(18) Coupling high pressure air hoses. Sections of high pressure air hoses shall be properly coupled and have safety chains or equivalent safety device attached between the sections (30 psi or more is high pressure air).

(19) Punch bars. Open pipes shall not be used as punch bars if the use would create a hazard.

(20) Saw table limit stop or extension. Employees shall be protected from contact with the front edge of a circular saw by a limit stop which will prevent the forward swing of the cutting edge from extending beyond the edge of the table or a table extension shall be installed.

(21) Explosive-actuated tools. Explosive-actuated tool design, construction, operation and use shall comply with all requirements specified in "safety requirements for powder actuated fastening systems," adopted by the department of labor and industries. In addition, after using such tools a careful check shall be made in order to ascertain that no cartridges or charges are left where they could enter equipment or be accidentally discharged in any area where they could create a fire or explosion hazard.

(22) Approved life buoys. Where work is being performed on docks or adjacent to open water five feet or more in depth U.S. Coast Guard approved life buoys shall be provided. Such life buoys shall have sufficient line attached and be spaced at intervals not exceeding 200 feet.

(23) Ladders required on waterfront docks. Either permanent ladders or portable ladders which are readily available for emergency use shall be provided on all waterfront docks. Such ladders shall extend from the face of the dock to the water line at its lowest elevation. Spacing between ladder installations shall not exceed 400 feet. The dock area immediately adjacent to ladder locations shall be painted with a bright color which contrasts with the surrounding area. A suitable method shall be used to secure the ladders.

(24) Protection from hot pipes. All exposed hot pipes within seven feet of the floor or working platform, or within 15" measured horizontally from stairways, ramps or fixed ladders, shall be covered with an insulating material or be guarded in such a manner as to prevent contact.

(25) Prevent overhang while removing materials. Extreme care shall be taken to prevent material from creating an overhang while removing the materials from piles or bins.

(26) Establishments subject to chapter 296-79 WAC shall comply with the following standards of the American National Standards Institute:

(a) ANSI Z33.1-1961, Installation of Blower and Exhaust Systems for Dust, Stock and Vapor Removal or Conveying;

(b) ANSI B56.1-1969, Safety Standard for Powered Industrial Trucks.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 82-13-045 (Order 82-22), § 296-79-020, filed 6/11/82; Order 77-12, § 296-79-020, filed 7/11/77; Order 74-24, § 296-79-020, filed 5/6/74; Order 70-6, § 296-79-020, filed 7/10/70, effective 8/10/70.]

WAC 296-79-030 Guards and guarding. (1) General safety and health standards to prevail where applicable. Driving mechanisms, power transmission equipment or apparatus, prime movers, shear or pinch points or other similar hazardous areas of exposure shall be properly safeguarded with standard safeguards as required by the general safety and health standards.

(2) Safeguarding specific areas, machines or conditions. To augment the general safeguarding requirements contained in the previous rule, certain equipment, tools, machines, and areas present definite hazards and shall be safeguarded by compliance with the following requirements:

(a) Conveyors. Hazardous areas of conveyors shall be adequately safeguarded or workers shall be protected from hazard by other effective means.

(b) Broke shredders. Cutting heads shall be completely enclosed except for opening at feed side sufficient only to permit entry of stock. The enclosure shall be bolted or locked in place and shall be of solid material or with mesh or other openings not exceeding 1/2 inch.

(c) Sharp edged slitter knives. Sharp edged slitter knives subject to accidental contact shall be effectively guarded. Carriers shall be provided and used when transporting or carrying sharp edged slitter knives.

(d) Wheels of traveling sections of conveyors. Traveling sections of conveyors and other equipment with wheels which run on rails or guides, other than railroad equipment, shall be provided with wheel sweep guards installed in front of the traveling wheels in all areas where persons may be exposed to contact. Sweep guards shall have not greater than 1/4 inch clearance above the rail or guide.

(e) Stitching or sewing machine. Carton or bag stitching machines shall be properly safeguarded to prevent persons from coming in contact with the stitching head and other pinch or nip points.

(f) Beaters and pulpers. Where the top edge of vessels or tubs is less than standard height guardrails above the floor or operator's platform, a guardrail of standard height shall be installed. If necessary for the protection of the person feeding equipment, an intermediate guardrail or other suitable protection shall be installed. Beater rolls shall be provided with covers.

(g) First dryer. A permanent guard or apron guard, or both, shall be installed to protect workers from any exposed

ingoing nip of the first dryer drum in each section if the area is accessible to workers while the dryer is in operation.

(h) Floor and drain openings. Floor and drain openings in walkways and general work areas shall be covered with material or gratings with openings no larger than 2" in the narrow dimension.

(i) Mechanical devices to dump chip cars, trucks or trailers. When using mechanical equipment to elevate the front end of the chip containers for dumping into a hopper, the shear area between the floor and the elevated section shall be safeguarded. The pit area shall be adequately safeguarded or barricaded. Safeguards shall be installed around the exposed sides of a chip hopper.

(3) Replacing guards. All permanent guards must be replaced or adequate temporary safeguards provided before a machine is put into operation.

(4) Protection from moving materials. When material, such as chunks, slivers, cants, or logs could be thrown or flipped by a saw, barker, or other machines, adequate barricades, screens, netting, or other safeguards shall be provided and maintained.

(5) Circular saws (not slasher saws). Saws shall be provided with standard guards, in accordance with American National Standard 01.1-1954 (reaffirmed 1961).

(6) Protection for areas where guards are impractical. Where normal guarding is impractical the hazard shall be reduced to a minimum by use of safety chains, lifelines, signs or other reasonable means. Areas which present a major physical hazard which cannot be reasonably safeguarded shall be identified by use of paint or other materials.

(7) Transporting knives. Knives used for chip or hog fuel machines, or guillotine cutters, shall be secured in properly constructed containers during transportation.

(8) Hand knife or scissors. Workers shall be furnished properly designed and constructed sheaths for safely carrying knives and scissors used for cutting or trimming pulp and paper.

(9) Safe storage for knives and scissors. Tables where paper is being cut shall be equipped with sheaths or shelves for safe storage of knives and scissors.

(10) Safeguard for foot operated treadle switch used to activate power driven equipment. Foot operated treadle switches used for activation of power driven equipment shall be protected by a stirrup type guard or equivalent protection shall be provided to prevent accidental activation.

(11) Automatic pressure actuated stopping devices. Hand fed machines and other moving equipment which create shear or pinch points which cannot be reasonably guarded may be safeguarded by the installation of pressure activated bars or sensing devices which, when contacted, will automatically stop the machine or equipment.

[Order 74-24, § 296-79-030, filed 5/6/74; Order 70-6, § 296-79-030, filed 7/10/70, effective 8/10/70.]

WAC 296-79-040 Fire protection and ignition sources. (1) Portable fire extinguishers. Portable fire extinguishers shall be constructed, tested, maintained, and used in accordance with the recommendations specified by the National Fire Protection Association or other similar recognized agencies.

(2) Suitable fire extinguishing equipment. Fire extinguishing equipment suitable for use for the type or types of fire which could be expected in an area shall be provided.

(3) Vaporizing liquid type extinguishers. Vaporizing liquid type extinguishers shall not be used if known to create a condition which is hazardous to health.

(4) Proper type of fire extinguisher to be used. Each person who is expected or required to use fire extinguishing equipment shall be instructed as to the proper type or types of extinguishing equipment to be used for each class of fire.

(5) Fire drills, etc. Personnel shall be instructed on procedures to be followed in case of fire.

(6) Posting areas where fire or explosion hazards exist. Areas where a fire or explosion hazard exists shall be posted with NO SMOKING or other suitable signs which would indicate that such hazard exists.

(7) Sources of ignition prohibited in hazardous areas. Spark-producing tools, lights or other sources of ignition shall not be used in any area where the hazard of explosion exists.

(8) Welding and burning permits. A written welding or burning permit shall be secured from a delegated person when welding and burning is to be done in an area near flammable or combustible materials or in areas where a potentially explosive condition exists. Permits shall not be valid for more than 24 hours.

(9) Internal dust fires in or around gas hoods. A safe written procedure shall be developed by the company for control of dust fires in or around gas hoods. Personnel shall be properly instructed and trained in this procedure.

[Order 74-24, § 296-79-040, filed 5/6/74; Order 70-6, § 296-79-040, filed 7/10/70, effective 8/10/70.]

WAC 296-79-050 Personal protection. (1) Personal protective equipment and clothing. Personal protective clothing and equipment as required by the general safety and health standards and the general occupational health standards shall be furnished by the employer and worn or used by the employee when needed to eliminate or minimize the degree of hazard involved with any specific operation.

(a) Required clothing, caps, etc. Employees shall wear sufficient clothing to protect them from hazards to which they may be exposed while performing their duties. Consideration must be given to temperatures in certain areas in which persons work. Employees whose hair is long enough to be caught in machinery or equipment around which they work shall wear caps, hair nets or other protection which will adequately confine the hair while performing their duties.

Rings or other jewelry which could create a hazard should not be worn by employees while in the performance of their work.

(b) Protective footwear. Employees who work in areas where there is a possibility of foot injury due to falling or rolling objects shall wear safety type footwear. Shoe guards and toe protectors will be supplied by management. Management shall also make safety shoes available for purchase by employees at not more than actual cost to management.

Calks or other suitable footwear which will afford reasonable protection from slipping shall be worn while working on logs. Calk boots shall be made available at cost.

Note: See chapter 296-24 WAC, Part A-2, for additional personal protective equipment requirements.

(2) Working over or near water.

(a) Employees working over or near water who are exposed to the danger of drowning shall be provided with and shall wear U.S. Coast Guard approved personal flotation devices.

Note: The following exceptions will apply:

- (i) When water is known to be chest-deep or less on the exposed worker(s);
- (ii) When the employee is protected by standard guardrails;
- (iii) When the employee is protected by a safety belt or lanyard; or
- (iv) When the employee is within the confines of the cabin of a boat or other equivalent enclosure.

(b) Prior to and after each use, buoyant work devices shall be inspected for defects which would alter their strength or buoyancy. Defective units shall not be used.

(3) Protection from noise. The hearing protection requirements of the general occupational health standards, chapter 296-62 WAC, shall apply.

(4) Respiratory protection. The respiratory protection requirements of the general occupational health standards, chapter 296-62 WAC, shall apply.

[Statutory Authority: Chapter 49.17 RCW. 94-20-057 (Order 94-16), § 296-79-050, filed 9/30/94, effective 11/20/94; 89-11-035 (Order 89-03), § 296-79-050, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-79-050, filed 11/30/83; 82-13-045 (Order 82-22), § 296-79-050, filed 6/11/82; Order 74-24, § 296-79-050, filed 5/6/74; Order 70-6, § 296-79-050, filed 7/10/70, effective 8/10/70.]

WAC 296-79-060 Protection from radiation. Special rules and regulations regarding the use of ionizing radiation shall be posted and followed as required by the atomic energy commission or the appropriate state agency, whichever has authority. For protection from other types of radiation, the rules contained in the general occupational health standards, chapter 296-62 WAC, shall prevail.

[Order 74-24, § 296-79-060, filed 5/6/74; Order 70-6, § 296-79-060, filed 7/10/70, effective 8/10/70.]

WAC 296-79-070 Illumination. (1) Sufficient illumination required. All areas shall be sufficiently illuminated in order that persons in the area can safely perform their assigned duties. The recommended levels of illumination specified in the general occupational health standards shall be followed where applicable. When areas are not specifically referred to in the general occupational health standards and the adequacy of illumination for the area or task performed is questionable, a determination of the amount of illumination needed shall be made by the industrial hygiene section of the division of industrial safety and health.

(2) Emergency or secondary lighting system required.

(a) There shall be an emergency or secondary lighting system which can be actuated immediately upon failure of the normal power supply system. The emergency or secondary lighting system shall provide illumination in the following areas:

(i) Wherever it is necessary for workers to remain at their machine or station to shut down equipment in case of power failure.

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(ii) At stairways and passageways or aisles used by workers as an emergency exit in case of power failure.

(iii) In all plant first aid and/or medical facilities.

(b) Emergency lighting facilities shall be checked at least every 30 days for mechanical defects. Defective equipment shall be given priority for repair schedule.

(3) Extension cord type lights. All extension cord type lights shall be provided with proper guards.

[Order 74-24, § 296-79-070, filed 5/6/74; Order 70-6, § 296-79-070, filed 7/10/70, effective 8/10/70.]

WAC 296-79-080 Elevators, manlifts and other lifting devices. (1) Elevators, manlifts, etc. All elevators, manlifts or other lifting devices shall be installed and maintained in conformity with the requirements specified in the Washington state elevator laws and regulations adopted by the elevator section of the division of building and construction safety inspection, department of labor and industries.

(2) Inspection of elevators, etc., for acid towers. Outside elevators shall be inspected daily during winter months when ice materially affects safety. Elevators, runways, stairs, etc., for acid towers shall be inspected monthly for defects that may occur because of exposure to acid or corrosive gases.

(3) Gas masks on elevators. Elevators located in areas where exposure to potentially harmful concentrations of toxic substances may occur shall be equipped with an adequate supply of gas masks to protect the maximum number of passengers.

(4) Posting elevators. Elevators shall be posted indicating the maximum number of persons allowed to ride.

[Order 74-24, § 296-79-080, filed 5/6/74; Order 70-6, § 296-79-080, filed 7/10/70, effective 8/10/70.]

WAC 296-79-090 Electrical equipment and distribution. (1) National electrical code to prevail. All electrical installations and electrical utilization equipment shall comply with chapter 296-24 WAC Part L.

(2) Authorized personnel to do electrical work. Only those persons who are qualified to do the work assigned and are authorized by the employer shall be allowed to perform electrical work on any electrical equipment or wiring installations.

(3) High voltage areas to be guarded. Motor rooms, switch panel rooms or other areas where persons may come in contact with high voltages shall be fenced off or be enclosed in a separate area. The gate, door or access to such area shall be posted with a notice stating that only authorized persons are allowed in the area.

(4) Control panels. Floor stand panels should be protected from being struck by moving equipment and handles and buttons shall be protected from accidental actuation.

(5) Switches or control devices. Switches, circuit breakers or other control devices shall be so located that they are readily accessible for activation or deactivation and shall be marked to indicate their function or machine which they control. The positions of ON and OFF shall be marked or indicated and provision shall be made for locking or tagging out the circuit.

(6) Starting requirements for electrically driven equipment after power failure. Electrically driven equipment shall

[Title 296 WAC—p. 1851]

be so designed that it will not automatically start upon restoration of power after a power failure if it will create a hazard to personnel.

(7) Posting equipment automatically activated or remotely controlled. Equipment which is automatically activated or remotely controlled shall be posted, warning persons that machine may start automatically if it will create a hazard to personnel.

[Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-79-090, filed 11/22/91, effective 12/24/91; Order 74-24, § 296-79-090, filed 5/6/74; Order 70-6, § 296-79-090, filed 7/10/70, effective 8/10/70.]

WAC 296-79-100 Floors, platforms, stairways, ladders, loading docks. (1) Construction and maintenance. Floors, platforms, stairways, ladders, and loading docks shall be constructed, maintained and used in accordance with the requirements specified in the general safety and health standards and shall have nonskid type surfaces where needed to minimize the hazard of slipping.

[Order 74-24, § 296-79-100, filed 5/6/74; Order 70-6, § 296-79-100, filed 7/10/70, effective 8/10/70.]

WAC 296-79-110 Elevated runways and ramps used by vehicles. (1) Elevated runway and ramp construction. Elevated runways or ramps shall be constructed to safely support four times the weight of any load to which it may be subjected. Runways and ramps shall be cleated, grooved, rough surfaced, or covered with a material which will minimize the danger of skidding. The maximum inclination of a ramp used for wheeled equipment shall not exceed 20° from horizontal.

(2) Guarding exposed sides. Elevated ramps or runways used for the travel of wheeled equipment shall have exposed sides guarded with a substantial bull rail or shear rail of sufficient height to prevent wheeled equipment from going over the rail. Standard guardrails shall be installed on runways wherever the height exceeds 4 feet above the adjacent area except where used for loading or unloading purposes.

[Order 74-24, § 296-79-110, filed 5/6/74; Order 70-6, § 296-79-110, filed 7/10/70, effective 8/10/70.]

WAC 296-79-120 Scaffolds, construction, use and maintenance. Whenever work must be performed at a height which cannot be reached from the floor or permanent platform and where it would not be safe practice to use a ladder, a properly constructed scaffold shall be provided and used. All scaffolds shall have a factor of safety of four times any load to which they may be subjected and be adequately secured or stabilized to prevent tipping. Scaffolds shall be constructed in accordance with acceptable engineering practices and shall be maintained in a safe condition. Tools or materials which would create a tripping hazard or which may fall from the platform shall be secured or removed. Persons shall not ride on a roller scaffold while it is being moved.

[Order 74-24, § 296-79-120, filed 5/6/74; Order 70-6, § 296-79-120, filed 7/10/70, effective 8/10/70.]

WAC 296-79-130 Crossovers, aisles, passages. (1) Crossing conveyors. Where access is required, crossovers or underpasses with proper safeguards shall be provided over or under all conveyors.

[Title 296 WAC—p. 1852]

(2) Clearances to be marked. Low clearance areas under conveyors which could present a hazard to mobile equipment operations shall be identified by a suitable means, such as signs, contrasting colors, or tell-tales.

(3) Aisles or passageways. Aisles or passageways should be at least three feet wider than the widest vehicle or load traveling the aisle or passageway. When this clearance cannot be maintained, adequate precautions shall be taken.

(4) Crossovers over obstructions in passageways. Crossovers shall be provided where employees are required to cross over transmission drive lines or other permanent obstructions in passageways or walkways.

[Order 74-24, § 296-79-130, filed 5/6/74; Order 70-6, § 296-79-130, filed 7/10/70, effective 8/10/70.]

WAC 296-79-140 Installation, inspection, and maintenance of pipes, piping systems, and hoses. (1) Definitions applicable to this section.

(a) Hazardous material system - any system within the following classifications:

(i) Flammable or explosive - any system containing materials which are hazardous because they are easily ignited and create a fire or explosion hazard, defined by NFPA as Class I liquids;

(ii) Chemically active or toxic - any system containing material which offers corrosion or toxic hazard in itself or can be productive of harmful gases upon release, defined by NFPA 704M as Class 3 and 4 materials;

(iii) Thermally hazardous - any system above 130°F which exposes persons to potential thermal burns;

(iv) Pressurized - any gaseous system above 200 psig or liquid system above 500 psig.

(b) Piping system - any fixed piping, either rigid pipe or flexible hose, including all fittings and valves, in either permanent or temporary application.

(2) Design and installation. All new piping systems intended to be used in hazardous material service shall be designed and installed in accordance with applicable provisions of the ASME Code for Pressure Piping or in accordance with applicable provisions of ANSI B31.1 through B31.8. The referenced edition in effect at the time of installation shall be utilized.

Note: Both referenced standards have identical requirements.

(3) Inspection and maintenance.

(a) Management shall develop a formal program of inspections for all hazardous material piping systems. The program shall be based on sound maintenance engineering principle and shall demonstrate due consideration for the manufacturing specifications of the pipe, hose, valves and fittings, the ambient environment of the installation and the corrosive or abrasive effect of the material handled within the system.

(b) Type and frequency of tests and/or inspections and selection of inspection sites shall be adequate to give indications that minimum safe design operating tolerances are maintained. The tests may include visual or nondestructive methods.

(c) All companies shall submit their formal program of initial and ongoing inspections to the department for approval within one year after the effective date of this requirement.

(d) All existing hazardous material systems shall be inspected to the criteria of this section prior to two years after effective date, or in accordance with a schedule approved by the department.

(4) Inspection records.

(a) Results of inspections and/or tests shall be maintained as a record for each system.

(b) Past records may be discarded provided the current inspection report and the immediately preceding two reports are maintained.

(c) When a system is replaced, a new record shall be established and all past records may be discarded.

(d) The records for each system shall be made available for review by the department upon request.

(e) Portions of systems that are buried or enclosed in permanent structures in such a manner as to prevent exposure to employees even in the event of a failure, may be exempted from the inspection requirements only.

(5) Systems or sections of systems found to be below the minimum design criteria requirements for the current service shall be repaired or replaced with component parts and methods which equal the requirements for new installations.

(6) Identification of piping systems.

(a) Pipes containing hazardous materials shall be identified. It is recommended that USAS A13.1 "Scheme for Identification of Piping Systems" be followed.

(b) Positive identification of a piping system content shall be lettered legend giving the name of the content in full or abbreviated form, or a commonly used identification system. Such identification shall be made and maintained at suitable intervals and at valves, fittings, and on both sides of walls or floors as needed. Arrows may be used to indicate the direction of flow. Where it is desirable or necessary to give supplementary information such as hazard of use of the piping system content, this may be done by additional legend or by color applied to the entire piping system or as colored bands. Legends may be placed on colored bands.

Examples of legend which may give both positive identification and supplementary information regarding hazards or use are:

Ammonia	Hazardous liquid or gas
Chlorine	Hazardous liquid or gas
Chlorine dioxide	Hazardous liquid or gas
Sulphur dioxide	Hazardous gas
Liquid caustic	Hazardous liquid
Liquid sulphur	Hazardous liquid
Sulphuric acid	Hazardous liquid
Sodium chlorate	When dry, danger of fire or explosion

Note: Manual L-1, published by Chemical Manufacturers Association, Inc., is a valuable guide in respect to supplementary legend.

(c) When color, applied to the entire piping system or as colored bands, is used to give supplementary information it should conform to the following:

CLASSIFICATION	PREDOMINANT COLOR
F—Fire-protection equipment	Red
D—Dangerous materials	Yellow (or orange)
S—Safe materials	Green (or the achromatic colors, white, black, gray or aluminum)

and, when required,

P—Protective materials Bright blue

(d) Legend boards showing the color and identification scheme in use shall be prominently displayed at each plant. They shall be located so that employees who may be exposed to hazardous material piping systems will have a frequent reminder of the identification program.

(e) All employees who work in the area of hazardous material piping systems shall be given training in the color and identification scheme in use.

(7) Test holes not to be covered. Test holes in blow lines of piping systems shall not be covered with insulation or other materials.

(8) Steam hoses. Steam hoses shall be specifically designed to safely carry steam at any pressures to which they may be subjected.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-79-140, filed 6/17/81. Statutory Authority: RCW 49.17.040, 49.17.240, and chapters 43.22 and 42.30 RCW. 81-03-007 (Order 80-31), § 296-79-140, filed 1/8/81; Order 74-24, § 296-79-140, filed 5/6/74; Order 70-6, § 296-79-140, filed 7/10/70, effective 8/10/70.]

WAC 296-79-150 Mobile equipment and lift trucks.

(1) All industrial powered trucks should be engineered, designed, constructed, maintained and used in accordance with the recommendations specified in USAS B56.1-1969 "Safety Code for Powered Industrial Trucks."

(2) Operator training. Methods shall be devised by management to train personnel in the safe operation of powered industrial trucks and only trained and authorized operators shall be permitted to operate such vehicles.

(3) Special duties of operator. Special duties of the operator of a power-driven vehicle shall include the following:

(a) To test brakes, steering gear, lights, horns, warning devices, clutches, etc., before operating vehicle;

(b) Not to move a vehicle while an unauthorized rider is on his vehicle;

(c) To slow down and sound horn upon approaching blind corners or other places where vision or clearance is limited;

(d) To comply with all speed and traffic regulations and other applicable rules;

(e) To have the vehicle he operates under control at all times so that he can safely stop the vehicle in case of emergency; and

(f) When driving a fork lift vehicle on a grade, the load shall be kept on the upgrade side.

(4) Operator to be in proper position. Control levers of lift trucks, front end loaders, or similar types of equipment shall not be operated except when the operator is in his proper operating position.

(a) No person shall be permitted to ride on a powered hand truck unless it is so designed by the manufacturer. A limit switch shall be on operating handle—30 degrees each way from a 45-degree angle up and down.

(b) When a powered industrial truck is left unattended, load engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off, and brakes set. Wheels shall be blocked if the truck is parked on an incline.

(c) A powered industrial truck is unattended when the operator is 25 feet or more away from the vehicle which remains in his view, or whenever the operator leaves the vehicle and it is not in his view.

(d) When the operator of an industrial truck is dismounted and within 25 feet of the truck still in his view, the load engaging means shall be fully lowered, controls neutralized, and the brakes set to prevent movement.

(5) Raised equipment to be blocked. Employees shall not work below the raised bed of a dump truck, raised buckets of front end loaders, raised blades of tractors or in similar positions without blocking the equipment in a manner that will prevent it from falling. When working under equipment suspended by use of jacks, safety stands or blocking shall also be used in conjunction with the jack.

(6) Precautions to be taken while inflating tire. Unmounted split rim wheels shall be placed in a safety cage or other device shall be used which will prevent a split rim from striking the worker if it should dislodge while the tire is being inflated.

(7) Reporting suspected defects. If, in the opinion of the operator, a power-driven vehicle is unsafe, the operator shall report the suspected defect immediately to the person in charge. Any defect which would make the vehicle unsafe to operate under existing conditions shall be cause to take the vehicle out of service and it shall not be put back into use until it has been made safe.

(8) Safe speed. Vehicles shall not be driven faster than a safe speed which is compatible with existing conditions.

(9) Unobstructed view. Vehicle operators shall have a reasonably unobstructed view of the direction of travel, or, where this is not possible, the operator shall be directed by a person or by a safe guidance means or device.

Where practical, mirrors shall be installed at blind corners or intersections which will allow operators to observe oncoming traffic.

It is recommended that vehicles operating in congested areas should be provided with an audible or visual alarm system.

(10) Passengers to ride properly. Passengers shall not be permitted to ride with legs or arms extending outside any vehicle nor shall they be permitted to ride unless a passenger seat or other protective device is provided.

(11) Horns and lights.

(a) Each vehicle shall be provided with a horn.

(b) Any vehicle required to travel away from an illuminated area shall be equipped with a light or lights which adequately illuminate the direction of travel.

(12) Guard on operator's platform. Every power truck operated from an end platform or standing position shall be equipped with a platform extending beyond the operator's position, strong enough to withstand a compression load

equal to the weight of the loaded vehicle applied along the longitudinal axis of the truck with the outermost projection of the platform against the flat vertical surface.

(13) Brakes on power-driven vehicles. Vehicles shall be equipped with brakes and devices which will hold a parked vehicle with load on any grade on which it may be used. The brakes and parking devices shall be kept in proper operating condition at all times.

(14) Cleaning vehicles. All vehicles shall be kept free of excessive accumulations of dust and grease that may present a hazard.

(15) Moving vehicles. Vehicles shall be controlled manually while being pushed or towed except when a tow bar is used. Special precautions shall be taken when pushing vehicles where view is obstructed. Pushing of vehicles or railroad cars with the forks or clamps of a lift truck is prohibited.

(16) Prohibited forms of riding. Riding on tongue or handles of trailers or forks of vehicles is prohibited.

(17) Jumping on or off moving vehicles. Jumping on or off moving vehicles is prohibited.

(18) Traffic lanes, designation and systems. Regular traffic lanes should be established and clearly designated and followed whenever practical. A one-way traffic system should be employed if practical.

(19) Clear lanes. Traffic lanes being used by pedestrians or equipment shall be kept clear of dunnage, pallets, etc., and equipment not in use.

(20) Lifting capacity of vehicle to be observed. At no time shall a load in excess of the manufacturer's maximum lifting capacity rating be lifted, carried, or moved by a lift truck. Such lifting capacity can be altered with the approval of the equipment manufacturer.

(21) Posting rated capacity. The maximum rated lifting capacity of all lift trucks shall at all times be posted on the vehicle in such a manner that it is readily visible to the operator.

(22) Carrying loose material. Lift trucks shall not be used to carry loose loads of pipe, steel, iron, lumber, palletized material, rolls of paper, or barrels unless adequate clearance is provided and the loads are stabilized.

(23) Position of lift forks or clamps. The forks or clamps of lift trucks shall be kept as low as possible while the vehicle is moving. They shall be lowered to the floor when the vehicle is parked.

(24) Walking under loads prohibited. No person shall be allowed under the raised load of a lift truck.

(25) Hoisting of personnel on vehicle forks prohibited. Personnel shall not be hoisted by standing directly on the forks of vehicles.

(26) Using forklifts as elevated work platforms. A platform or structure built specifically for hoisting persons may be used providing the following requirements are complied with:

(a) The structure must be securely attached to the forks and shall have standard guardrails and toeboards installed on all sides.

(b) The hydraulic system shall be so designed that the lift mechanism will not drop faster than 135 feet per minute in the event of a failure in any part of the system. Forklifts used

for elevating work platforms shall be identified that they are so designed.

(c) A safety strap shall be installed or the control lever shall be locked to prevent the boom from tilting.

(d) An operator shall attend the lift equipment while workers are on the platform.

(e) The operator shall be in the normal operating position while raising or lowering the platform.

(f) The vehicle shall not travel from point to point while workers are on the platform except that inching or maneuvering at very slow speed is permissible.

(g) The area between workers on the platform and the mast shall be adequately guarded to prevent contact with chains or other shear points.

(27) Overhead guards on lift trucks. All lift trucks shall be equipped with an overhead guard constructed and installed to conform to USAS B56.1-1969 "Safety Code for Powered Industrial Trucks." This guard may be removed only when it cannot be used due to the nature of the work being performed in which case loads shall be maintained so as not to create a hazard to the operator.

(28) Protection from exhaust system. Any exhaust system which would be exposed to contact shall be properly insulated or isolated to prevent personnel from being burned. Exhaust systems on lift trucks and jitneys shall be constructed to discharge either within 20" from the floor or 84" or more above the floor. The exhausted gases shall be directed away from the operator and the equipment shall be designed in such a manner that the operator will not be exposed to the fumes.

(29) Emergency exit from mobile equipment. Mobile equipment with an enclosed cab shall be provided with an escape hatch or other method of exit in case the regular exit cannot be used.

(30) Vehicle wheels chocked. When driving mobile equipment onto the bed of a vehicle, the wheels of the vehicle shall be chocked.

(31) Prevent trailer from tipping. Suitable methods shall be used or devices installed which will prevent the trailer from tipping while being loaded or unloaded.

(32) Refueling. Gasoline or LPG engines shall be shut off during refueling.

(33) Close valve on LPG container. Whenever vehicles using LP gas as a fuel are parked overnight or stored for extended periods of time indoors, with the fuel container in place, the service valve of the fuel container shall be closed.

(34) LP tanks. LP vehicle fuel tanks shall be installed and protected in a manner which will minimize the possibility of damage to the tank.

(35) Inspecting and testing of LPG containers. LPG containers shall be inspected and tested periodically.

(36) Spinners on steering wheels. The use of spinners on steering wheels shall be prohibited unless an anti-kick device is installed or the equipment has a hydraulic steering system.

[Order 74-24, § 296-79-150, filed 5/6/74; Order 70-6, § 296-79-150, filed 7/10/70, effective 8/10/70.]

WAC 296-79-160 Requirements for cranes and hoists—General safety and health standards to prevail. All applicable rules for design, construction, maintenance,

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operation and testing of cranes and hoists contained in the general safety and health standards shall be complied with.

[Order 74-24, § 296-79-160, filed 5/6/74; Order 70-6, § 296-79-160, filed 7/10/70, effective 8/10/70.]

WAC 296-79-170 Requirements for crawler and truck cranes. (1) Rated capacity chart. A chart indicating the manufacturer's rated capacity at all operating radii for all permissible boom lengths and jib lengths with alternate ratings for optional equipment affecting such ratings shall be posted in all mobile type cranes and shall be readily visible to the operator in his normal operating position.

(2) Boom length indicated. The length shall be plainly marked on each boom section of a mobile crane having a sectioned boom.

(3) Radius or boom angle indicator. A radius or boom angle indicator shall be installed where it is readily visible to the operator in his normal operating position on all cranes having a movable working boom.

(4) Safety device for light fixtures. Any light fixtures attached to crane boom or machinery house shall have a safety strap or other device attached which will prevent the fixture from falling.

(5) Boom stops. Boom stops shall be installed to govern the upward travel of the boom to a safe limit. Boom stops shall be of adequate strength to prevent the boom from traveling past the vertical position.

(6) Controls marked. Crane operating controls shall be marked or an explanation of the controls' functions shall be posted in full view of the operator.

(7) Locking hydraulic outriggers. Hydraulic outriggers shall be equipped with a pilot operated check valve or a mechanical lock shall be installed which will prevent outriggers from retracting in case of failure of the hydraulic system.

(8) Top of boom painted. The top six feet of the boom or jib shall be painted bright yellow or other bright contrasting color if the boom is yellow.

(Several makes of cranes are already "all yellow." Users say they want to retain the contrasting color theme to call attention to the boomtop.)

(9) Warning devices. All cranes shall be equipped with a suitable warning device such as a horn or whistle.

(10) Hook safety device. All hooks shall be equipped with a safety device or other effective means shall be used to prevent accidental unhooking of the load.

(11) Counterweight limited. The amount of crane counterweight shall not exceed the maximum amount specified by the crane manufacturer.

(12) Use proper size wire rope for sheaves. The size and diameter of sheaves and wire rope shall be compatible and follow the recommendations published by the Wire Rope Institute or other acceptable engineering practices.

(13) Loading or unloading gear. Unloading gear such as grapples, tongs, and buckets, shall not be left suspended when not in use.

(a) Where grapples, trip tongs or similar device is used for loading, the log holding device shall be lowered to the ground whenever the machine is unattended.

(14) No one under load. Personnel shall not position themselves under crane loads and such loads shall not be carried over workers.

(15) Operating clearance from stationary objects. A distance of 30" shall be maintained between the outermost part of a revolving crane and any stationary object within the swing radius of the crane where the area is accessible to workers or the hazardous area must be temporarily guarded or barricaded.

(16) Clearance requirements from unprotected electrical transmission and distribution lines.

(a) Except as provided in subdivision (b), all parts of cranes and loads being handled shall maintain the following specified clearances:

(i) For lines rated 50 kv or below, minimum clearance between the lines and any part of the crane or load shall be ten feet;

(ii) For lines rated over 50 kv minimum, clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1 kv over 50 kv, or twice the length of the line insulator but never less than 10 feet;

(iii) In transit with no load and boom lowered the equipment clearance shall be a minimum of 4 feet for voltages less than 50 kv, and 10 feet for voltages over 50 kv up to and including 345 kv, and 16 feet for voltages up to and including 750 kv;

(iv) A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means;

(v) Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.

(b) Cranes may be operated within the clearances specified in subdivision (a) only when the following precautions are taken:

(i) Lines may be deenergized and visibly grounded at the point of work; or

(ii) Lines owned or under the control of the employer may be deenergized, grounded and locked out on the employer's premises; or

(iii) On N.E.C. approved installation of insulated aerial cable, insulating barriers, not a part of or an attachment to the equipment or machinery, may be erected to prevent physical contact with the line.

(17) Operators shall avoid contacting overhead obstructions which may damage the boom or adversely affect stability. In instances where the operator may have difficulty in observing clearances, a signal person shall be stationed where they can observe clearances and signal the operator.

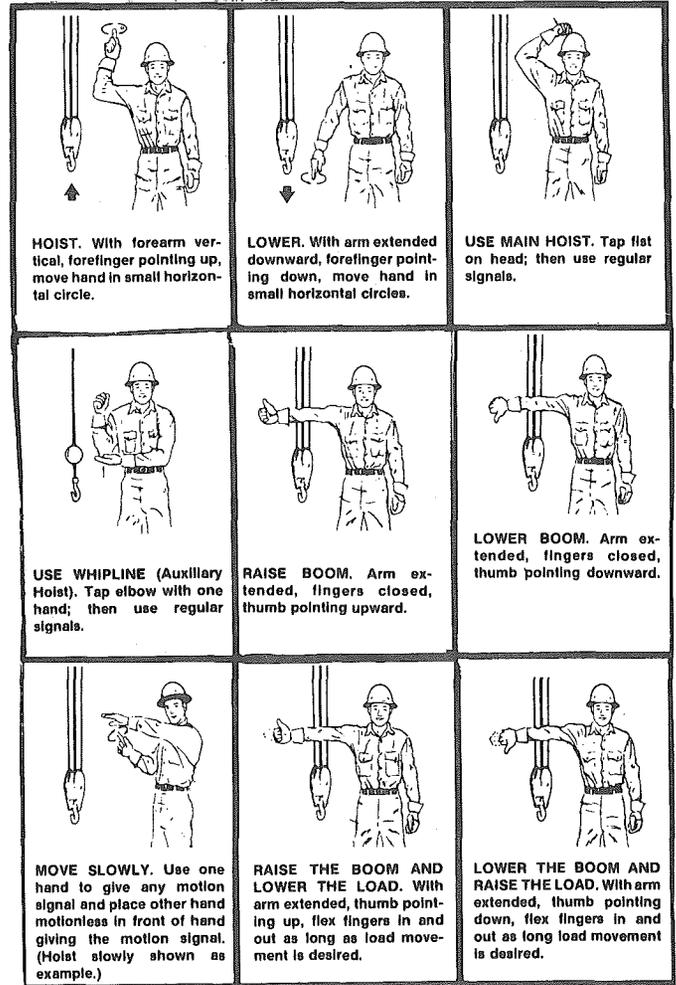
(18) Safe travel across thoroughfares or railroad tracks. When moving across thoroughfares or railroad tracks with cranes, shovels or similar types of equipment, which by its design does not allow the operator clear vision of approaching traffic, a flagperson shall be stationed where he/she can control other traffic and signal the equipment operator.

(19) One crew member to give signals. Only a designated member of the crew shall give signals to the crane operator except that anyone may give an emergency stop signal.

(20) Standard hand signals. When visual signals are used standard hand signals, as illustrated in the general safety and health standards, shall be used for directing crane operators.

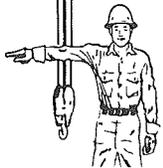
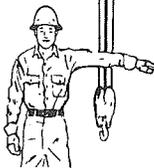
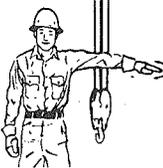
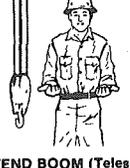
CRAWLER, LOCOMOTIVE, AND TRUCK CRANES

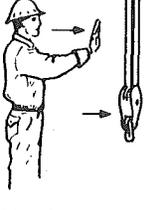
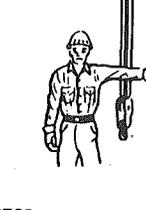
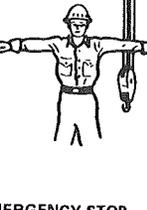
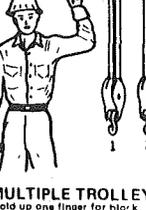
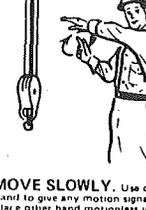
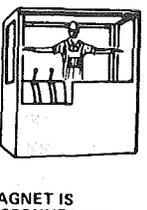
STANDARD HAND SIGNALS



OVERHEAD AND GANTRY CRANES
STANDARD HAND SIGNALS

CRAWLER, LOCOMOTIVE, AND TRUCK CRANES (CONTINUED)

 <p>SWING. Arm extended, point with finger in direction of swing of boom.</p>	 <p>STOP. Arm extended, palm down, hold position rigidly.</p>	 <p>EMERGENCY STOP. Arm extended, palm down, move hand rapidly right and left.</p>
 <p>TRAVEL. Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.</p>	 <p>CLASP EVERYTHING. Clasp hands in front of body.</p>	 <p>TRAVEL (Both Tracks). Use both fists in front of body, making a circular motion about each other, indicating direction of travel; forward or backward. (For crawler cranes only.)</p>
 <p>TRAVEL (One Track). Lock the track on side indicated by raised fist. Travel opposite track in direction indicated by circular motion of other fist, rotated vertically in front of body. (For crawler cranes only.)</p>	 <p>EXTEND BOOM (Telescoping Booms). Both fists in front of body with thumbs pointing outward.</p>	 <p>RETRACT BOOM (Telescoping Booms). Both fists in front of body with thumbs pointing toward each other.</p>
 <p>RETRACT BOOM (Telescoping Boom). One Hand Signal. One fist in front of chest, thumb pointing outward and heel of fist tapping chest.</p>	 <p>EXTEND BOOM (Telescoping Boom). One Hand Signal. One fist in front of chest with thumb tapping chest.</p>	

 <p>HOIST. With forearm vertical, forefinger pointing up, move hand in small horizontal circle.</p>	 <p>LOWER. With arm extended downward, forefinger pointing down, move hand in small horizontal circles.</p>	 <p>BRIDGE TRAVEL. Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.</p>
 <p>TROLLEY TRAVEL. Palm up, fingers closed, thumb pointing in direction of motion, jerk hand horizontally.</p>	 <p>STOP. Arm extended, palm down, move arm back and forth.</p>	 <p>EMERGENCY STOP. Both arms extended, palms down, move arms back and forth.</p>
 <p>MULTIPLE TROLLEYS. Hold up one finger for block marked "1" and two fingers for block marked "2". Regular signals follow.</p>	 <p>MOVE SLOWLY. Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example.)</p>	 <p>MAGNET IS DISCONNECTED. Crane operator spreads both hands apart, palms up.</p>

(21) Signals by use of radio frequencies. Class "D" citizen's band radio frequencies shall not be used for signaling crane operators.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-79-170, filed 6/17/81. Statutory Authority: RCW 49.17.040, 49.17.240, and chapters 43.22 and 42.30 RCW. 81-03-007 (Order 80-31), § 296-79-170, filed 1/8/81; Order 74-24, § 296-79-170, filed 5/6/74; Order 70-6, § 296-79-170, filed 7/10/70, effective 8/10/70.]

WAC 296-79-180 Privately owned standard gauge railroad operations. (1) Blue flag or light. A blue signal (blue flag or blue light for nonilluminated areas) shall be displayed at one or both ends of an engine, car(s), or train, to indicate that workers are under or about the railway equipment. When such warning devices are displayed, the equipment shall not be coupled to or moved. On a dead end spur, a blue signal may be displayed adjacent to the switch opening while cars are being loaded or unloaded.

(2) Work being carried on which subjects employees to the hazard of moving railroad equipment shall be protected by blue signals and derails set a minimum of 50 feet from one or both ends of the worksite. Where the spur track switch is less than 50 feet from the work location, the switch padlocked in the open position will take the place of the derail and the blue signal shall be placed at that point.

(3) Signals unobscured. Equipment which would obscure the blue signal shall not be placed on the track.

(4) Signals displayed by each maintenance crew. Each maintenance crew shall display and remove its own set of blue signals.

(5) Warning device. A flashing warning light or other device shall be installed near any opening which leads to a passageway crossing railroad tracks adjacent to the building. Such light or device shall be activated prior to any switching or movement of railroad equipment to warn workers of the dangerous condition in the area.

(6) Cars to be immobilized. Spotted cars shall either have brakes set, wheels blocked, or shall be coupled to other immobilized cars to prevent each car from rolling.

(7) Crawling under or between coupled cars prohibited. Workers shall not crawl under or pass between coupled railroad cars to cross tracks.

(8) Warning at road crossing. An audible whistle, horn or bell shall be sounded by the locomotive engineer to give adequate warning prior to switching across any road crossing.

(9) Flying switches. When switching railroad equipment in congested areas or across roadways or walkways "flying switches" shall be prohibited.

(10) Car opening devices. All box car doors and associated mechanisms shall be carefully inspected before workers attempt to open or close them. If the door is not free and cannot be opened safely by hand, equipment shall be provided, where necessary, and a safe method shall be used to open or close the door.

(11) Clearance from railroad tracks. Materials shall not be stacked or piled closer than 8 1/2' from the center line of a standard gauge railroad track.

(12) Operating under limited visibility conditions.

(a) Unless trains are operated in a manner to allow the operator to see a safe stopping distance in the direction of travel, a flagperson(s) shall be positioned in such a manner to safely direct movement of the train.

(b) Flagperson shall remain within sight of the operator or shall be equipped to maintain visual or voice communication with the operator as conditions dictate.

(13) A flagperson shall direct the movement of trains being moved across main roads or thoroughfares which do not have adequate traffic warning lights, bells or barricades.

[Statutory Authority: RCW 49.17.040, 49.17.240, and chapters 43.22 and 42.30 RCW. 81-03-007 (Order 80-31), § 296-79-180, filed 1/8/81; Order 74-24, § 296-79-180, filed 5/6/74; Order 70-6, § 296-79-180, filed 7/10/70, effective 8/10/70.]

WAC 296-79-190 Loading and unloading materials from railway cars or trucks. (1) Safe access to top of railroad cars or trucks. Platforms with ladders or stairways shall be installed or made available when needed so that workers may safely gain access to and perform work on the top of railroad cars or trucks when ladders are not installed on such equipment.

(2) Nets not to cover ladders. Rolled chip nets shall not be positioned where they cover the ladders on railroad cars or trucks.

(3) Tipple type unloading device. When a tipple type unloading device is used for removing chips from cars, the cars shall be properly secured in place and all employees shall be in the clear before dumping operation is started.

(4) Handling pulp chips and hog fuel from trucks and trailers.

(a) Elevating platform-type or cable-lift type unloading devices shall have adequate back bumper stops.

(b) Side rails or other positive means to prevent the trailer from falling shall be used while unloading single trailer units.

(c) The truck or tractor shall be secured when elevating platform lifts are used to elevate both the tractor and trailer or single unit trucks.

(d) All personnel shall be clear of all hoisting or elevating mechanisms before dumping commences.

(e) No person shall remain in any truck while the truck is being elevated.

(5) Taking chip samples. A safe area and suitable device shall be provided for the chip tester to use while taking chip samples.

(6) Derail required while unloading hazardous materials. To protect tank cars from being moved while loading or unloading hazardous materials by use of pipes or hoses, a derail and blue flag shall be set between the spotted tank cars and any moving railroad equipment.

(7) Moving cars by tugger or powered drums. When rail cars are moved by a tugger or powered drums with cables, a means should be provided or the area barricaded in such a manner that the moving cables do not endanger the workers.

(8) Handling pulpwood from flatcars and all other railway cars.

(a) Railroad flatcars for the conveyance of pulpwood loaded parallel to the length of the car shall be equipped with safety-stake pockets.

(b) Where pulpwood is loaded crosswise on a flatcar sufficient stakes of sizes not smaller than 4 by 4 inches shall be used to prevent the load from shifting.

(c) When it is necessary to cut stakes, those on the unloading side should be partially cut through first, and then the binder wires cut on the opposite side. Wire cutters equipped with long extension handles shall be used. No person shall be permitted along the dumping side of the car after the stakes have been cut.

(d) Cutting bands on log bundles. When cutting bands on bundled logs, workers shall position themselves in a safe location. Double bitted axes shall not be used for cutting bands. Caution shall be used to prevent being struck by ends of bands being cut and, if needed, personal protective equipment shall be worn.

(e) Flatcars and all other cars shall be chocked during unloading. Where equipment is not provided with hand brakes, rail clamping chocks shall be used.

(9) Handling pulpwood from trucks.

(a) Cutting of stakes and binder wires shall be done in accordance with (8)(c) of this section.

(b) Binders or stakes shall not be loosened or removed until the logs are secured and held by equipment which will prevent them from rolling off the truck, or barricades shall be provided which will prevent logs from striking the person removing the binders or stakes.

(c) Where binder chains and crane slings are used, the crane slings shall be attached and taut before the binder

chains are released. The hooker shall see that the helper is clear before signaling for the movement of the load.

(d) Driver to leave truck cab while unloading. The truck driver shall leave the truck cab and be in the clear, preferably in a designated area, and shall be in clear view of the unloading equipment operator while the unloader is approaching the loaded truck.

(e) Driver to remain outside cab during unloading. The truck driver shall remain outside the cab and clear of the load while logs are being unloaded except that after a complete load is lifted as a unit and held stationary he may enter the cab and drive forward from under the suspended load.

[Order 74-24, § 296-79-190, filed 5/6/74; Order 70-6, § 296-79-190, filed 7/10/70, effective 8/10/70.]

WAC 296-79-200 Bridge and dock plates. Properly constructed bridge or dock plates shall be furnished and used to bridge the area between a dock and truck or railroad car. The following requirements shall be complied with for construction and use of such bridge or dock plates:

(1) Strength. The plate shall be capable of supporting three times the maximum load to which it will be subjected.

(2) Stops required. The plates shall be provided with positive stops to prevent the plates from shifting or moving.

(3) Plates to bear solidly. The plates shall bear solidly on the dock and on the floor of the car or truck. Plates with excessive teeter or rock shall be repaired or replaced.

(4) Upright or lip on plates. The sides of bridge or dock plates shall have an upturn or lip of at least 4" covering the area between the edge of the loading dock and edge of car or truck floor whenever this distance exceeds 18" to prevent wheeled equipment from running off the sides.

(5) Bearing surface. Bridge or dock plates shall have at least 6" bearing surface on the loading dock.

(6) Suitable fittings to be used. Bridge or dock plates intended to be moved by mechanized equipment shall be designed for this purpose or appropriate fittings or attachments shall be used.

[Order 74-24, § 296-79-200, filed 5/6/74; Order 70-6, § 296-79-200, filed 7/10/70, effective 8/10/70.]

WAC 296-79-210 Belt, chain and roller type conveyors, maintenance and inspection. (1) Protection from falling material. Whenever conveyors pass adjacent to or over working areas or passageways used by personnel, protective guards shall be installed. These guards shall be designed to catch and hold any load or materials which may fall off or become dislodged and injure a worker.

(2) Walking on rolls prohibited. Employees shall not be allowed to walk on the rolls of roller type conveyors except for emergency.

(3) Guarding shaftway and material entrances of elevator type conveyors. Guards, screens or barricades of sufficient strength and size to prevent material from falling shall be installed on all sides of the shaftway of elevator type conveyors except at openings where material is loaded or unloaded. Automatic shaftway gates or suitable barriers shall be installed at each floor level where material is loaded or unloaded from the platform.

(1999 Ed.)

(4) Emergency conveyor stops. Conveyors shall be provided with an emergency stopping device which can be reached from the conveyor. Such device shall be located near the material entrance to each barker, chipper, saw, or similar type of equipment except where the conveyor leading into such equipment is under constant control of an operator who has full view of the material entrance and is located where he cannot possibly fall onto the conveyor.

(5) Safe access to conveyors. Where conveyors are in excess of 7' in height, means shall be provided to safely permit essential inspection and maintenance operations.

(6) Adjustment. All take-up devices provided for the purpose of adjusting for stretch in the belt, chain or cable should be checked at intervals for proper functioning and adjustment.

(7) Worn parts. Any part showing signs of significant wear shall be inspected carefully and replaced prior to reaching a condition where it may create a hazard.

(8) Replacement of parts. Replacement parts shall be equal to or exceed the manufacturer's specifications.

[Order 74-24, § 296-79-210, filed 5/6/74; Order 70-6, § 296-79-210, filed 7/10/70, effective 8/10/70.]

WAC 296-79-220 Deactivating and lockout requirements. (1) Tagout or other alternative security procedures shall be phased out by (one after effective date). In the one year interim, all requirements and procedures of this section shall apply except:

(a) Physical restraint devices other than padlocks may be used.

(b) Whenever devices other than identified padlocks are used, a warning information tag shall be required.

(c) Whenever the operating control cannot be physically blocked by the restraining device, a warning information tag shall be required.

(2) Control requirement. Whenever the unexpected start-up of machinery, the energizing of electrical circuits, the flow of material in piping systems or the removal of guards would endanger workers, such exposure shall be prevented by deactivating and locking out the controls as required by this section.

EXCEPTION:

In instances where any machine must be in motion for proper adjustment, for removal or replacement of materials from the machine, for machine clothing changes or for roping up, the following precautions shall be observed:

(a) The machine shall be operated at slow or jog speed;

(b) Extension tools which minimize personnel exposure shall be used where possible;

(c) The operating controls shall at all times be under the control of a qualified operator or craftsman;

(d) All personnel shall remain in view of the operator or other means of communication shall be established whenever possible;

(e) All personnel must be beyond the reach of other machine section(s) or element(s) which offer potential exposure. In any instance where such potential exposure exists, such other section(s) or element(s) shall be separately locked out.

(3) Equipment requirements.

[Title 296 WAC—p. 1859]

(a) The employer shall provide and each employee shall use as many padlocks, tags, chains, or devices as required to implement these requirements.

(b) Provisions shall be made whereby the source of power or exposure can be locked out in accordance with the requirements of this section.

(c) On electrically powered equipment, "stop/start" control switches shall not be used as lockout switches. Lockout switches must be circuit disconnects and must adequately separate the power source from the prime mover so that accidental startup of the equipment being locked out is precluded.

(4) Training requirements.

(a) Each person who will be given authority to implement these requirements shall first be thoroughly trained in the requirements and procedures.

(b) Before being given authority to deactivate and lockout a particular system or piece of equipment, authorized personnel shall be made fully aware of all power sources and/or material entry sources which may offer exposure.

(c) On complex systems or equipment which contain multiple lockout points not at the immediate work location, a complete checklist of all lockout points necessary for isolation is recommended to help eliminate the chance of human error.

(5) Control procedure.

(a) Each person who would be exposed to the hazard shall apply a personal padlock on the control mechanism. Padlocks shall be applied in such a manner as to physically block the control from being moved into the operating position. Each lock shall be personally identified or an information tag identifying the owner shall be attached to the lock.

(b) Padlocks used in lockout procedures may only be removed by the person identified on the lock, except, when it is positively determined that the owner/user of the lock has left the premises without removing a lock, the job supervisor may remove the lock in accordance with a specific procedure formulated by the local plant labor/management safety committee or approved by the department.

(6) Testing after lockout or tagout. After tagging or locking out equipment, a test shall be conducted to ascertain that the equipment has been made inoperative or the flow of material has been positively stopped. Precautions shall be taken to ascertain that persons will not be subjected to hazard while conducting test if power source or flow of material is not shut off.

(7) Alternate lockout procedure. Before an alternate procedure can be utilized, a specific written procedure shall be reviewed by the local plant labor/management safety committee and approved by the department of labor and industries.

(8) Temporary or alternate power to be avoided. Whenever possible, temporary or alternate sources of power to the equipment being worked on shall be avoided. If the use of such power is necessary, all affected employees shall be informed and the source of temporary or alternate power shall be identified.

(9) Where tags are required to implement these lockout and control procedures, the tag and attachment device shall be constructed of such material that it will not be likely to deteriorate in the environment that it will be subjected to.

(10) Provisional exception. Electrical lighting and instrument circuits of 240 volts or less on single phase systems or 277 volts on three-phase systems may be exempted from the lockout requirements of (5)(a) of this section provided that:

(a) An information tag meeting the requirements of subsection (9) of this section is used in lieu of a padlock;

(b) The information tag shall be placed on the switch or switch cover handle in such a manner as to easily identify the deactivated switchgear.

(11) Deactivating piping systems.

(a) Hazardous material systems are defined as: Gaseous systems that are operated at more than 200 psig; systems containing any liquid at more than 500 psig; systems containing any material at more than 130°F; systems containing material which is chemically hazardous as defined by NFPA 704 M Class 3 and 4; systems containing material classified as flammable or explosive as defined in NFPA Class I.

(b) Lockout of piping systems shall provide isolation to the worksite, including backflow where such potential exists and the system is classified as a hazardous material system. The required method shall be applied based on the content of the system as specified below:

(i) Nonhazardous systems shall be deactivated by locking out either the pump or a single valve.

(ii) Hazardous material systems shall be deactivated by one of the following methods:

(A) Locking out both the pump and one valve between the pump and the worksite;

(B) Locking out two valves between the hazard source and the worksite;

(C) Installing and locking out a blank flange between the hazard source and worksite;

(D) On hazardous chemical systems where methods (A), (B) or (C) are not available, or where methods (A), (B) or (C) by themselves create a hazard, single valve closure isolation may be used provided that potentially exposed employees are adequately protected by other means such as personal protective equipment.

(E) On all steam systems where methods (A), (B) or (C) are not available, single valve closure isolation may be used provided that the system is equipped with valves meeting all requirements of ANSI B16.5 and ANSI B16.34. Where single valve isolation is used, the steamline must also be equipped with a bleed valve downstream from the valve closure to prove isolation of the worksite.

(12) Reactivating separated hazardous material systems. When a blank flange (blind) is used to separate off portions of hazardous material systems from a portion which is in operation, removal of the blind offers potential exposure to employees. The removal procedure shall be protected by:

(a) Two separate valve closures between the blank flange and the potential exposure; or

(b) A single valve closure with a bleeder valve or weep drain between the blank flange and the valve closure. Employees shall closely check for evidence of escapement from the bleeder valve or weep plug before starting to remove the blank flange.

(c) Where subdivisions (a) or (b) are not possible or, in themselves create a hazard, potentially exposed employees

must be adequately protected by personal protective equipment before removing the blank flange.

(d) Bleeder valves are recommended behind all primary valve closures on hazardous material systems. Consideration should be given to the nature of the material in the system when installing bleeder valves. To assist in preventing plugging, bleeder valves should generally be installed in the top one-third of the pipe. Short exhaust pipes should be installed on bleeder valves to direct the flow of possible escapement away from the position where an employee would normally be when using the bleeder valve.

[Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240, 81-13-053 (Order 81-9), § 296-79-220, filed 6/17/81. Statutory Authority: RCW 49.17.040, 49.17.240, and chapters 43.22 and 42.30 RCW, 81-03-007 (Order 80-31), § 296-79-220, filed 1/8/81; Order 76-7, § 296-79-220, filed 3/1/76; Order 74-24, § 296-79-220, filed 5/6/74; Order 70-6, § 296-79-220, filed 7/10/70, effective 8/10/70.]

WAC 296-79-230 Vessel or confined area requirements. (1) Management's responsibility for planning. Management shall be responsible for developing a written procedure to be followed for safe entry of employees into confined areas, tanks, vessels, or sewers and for maintaining a safe condition while work is being performed therein. Such procedure shall include the following minimum requirements:

(a) All vessels, sewers or confined areas must be properly ventilated at all times. Such areas shall be tested and/or evaluated by a person thoroughly trained and instructed in the use of instruments required, or qualified to make evaluations of conditions which may be encountered, before employees enter and at reasonable intervals as work progresses. Special consideration shall be given to the possibility that the area may be deficient of oxygen or may contain dangerous concentrations of gases or toxic substances.

(b) Each vessel, tank or confined area shall be cleaned and/or purged as thoroughly as practical prior to entry.

(c) All equipment necessary to perform the work, including safety equipment, must be at the job site and shall be inspected or tested to assure that it functions properly.

(d) All electrical circuits, valves, ducts, pipes, and other equipment shall be locked out, tagged out, or blanked as required in accordance with the applicable rules contained in WAC 296-79-220 of this chapter.

(e) Prior to and while welding or burning is being done in areas where a fire or explosion hazard may exist, the applicable rules contained in WAC 296-79-040 of this chapter, shall be complied with.

(f) For evaluating conditions concerning health, fire or explosion hazards, requirements outlined in the general occupational health standards, chapter 296-62 WAC, shall be followed.

(2) Designated person in charge. Management shall designate an individual who shall be responsible for the safety of the employees and institute such means, methods, and practices as to render the work and place of work safe. The designated person shall ascertain that the required written procedures are followed.

(3) Employees to be thoroughly instructed in procedure. All employees involved in the entry of vessels or confined areas shall be thoroughly instructed in safe procedures to be followed.

(1999 Ed.)

(4) Protective equipment required. Any employee entering a vessel or enclosed area shall use any protective equipment or clothing needed to afford him proper protection. Each person shall wear equipment capable of providing safe respirable air if the area may be deficient of oxygen or shall wear proper respiratory protective equipment if the atmosphere may contain a hazardous concentration of contaminants. In addition, while entering or working in an atmosphere immediately hazardous to health, employees shall wear a safety harness with lifeline attached and continue to wear such equipment so long as the hazard exists.

(5) Attendant required. An attendant shall remain outside at the opening of the confined area to render assistance necessary to persons inside. The attendant shall be provided with life support equipment necessary for his protection if an emergency arises which would require him to enter the area.

(6) Life support equipment required. Life support equipment which will afford proper protection to the employee from any condition which may arise shall be available either within the vessel or confined area or at the entrance thereto.

(7) Mechanical device required when entry from the top. Where employees must enter a vessel or confined area from the top, and where it would be impossible to manually rescue or remove over persons in the area, a mechanical device shall be provided with which the attendant can lift employees out.

(8) Electrical shock protection. Electrical circuits leading into vessels or confined areas where electrical conductive hazards exist shall be protected by a ground fault interrupter or the voltage shall not exceed 24 volts.

(9) Battery operated flashlights or lanterns. Battery operated flashlights or lantern shall be readily available for use by persons working in areas where escape would be difficult if normal lighting system should fail. Only explosion-proof type lights shall be taken into any atmosphere which may contain an explosive concentration.

(10) Use of materials which may create hazardous atmosphere. Tests shall be conducted at reasonable intervals when using materials for cleaning, coating or other purposes which may cause the atmosphere to become hazardous.

[Order 74-24, § 296-79-230, filed 5/6/74; Order 70-6, § 296-79-230, filed 7/10/70, effective 8/10/70.]

WAC 296-79-240 Storage of fuel, oil, flammables and chemicals. (1) Handling and labeling of flammable and hazardous materials. Containers of toxic, flammable or irritating substances shall be properly labeled and stored as specified in "precautionary labeling of hazardous substances used in places of employment," as adopted by the department of labor and industries.

(2) To be stored away from sources of ignition. Fuels, oils, flammable chemicals or other flammable materials shall be stored in a room or area away from sources of ignition.

(3) Provide for safe handling. Provisions shall be made for handling drums safely and means shall be afforded to position drums on their sides when material must be discharged from a valve or spigot placed in the top of the drum.

(4) Bonding (grounding) required. When dispensing material which may be ignited by static electricity, a method

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shall be provided to properly bond (ground) the drum and container into which material is being dispensed.

(5) Storage of drums. Drums shall be stored in a manner which will prevent them from falling or rolling.

(6) Bagged or drummed chemicals. Bagged or drummed chemicals shall be handled properly to prevent spillage or damage to the containers. Chemicals shall be stored in such a manner that they will not decompose, contaminate, or react with other chemicals which could present a hazard. The manufacturer's safe practices recommendations or those published by the Manufacturing Chemists Association should be followed.

(7) Storing liquid chlorine tanks. Sufficient and adequate ventilation shall be provided when liquid chlorine tanks are stored in a room. At least two exits, remote from each other, shall be provided for all rooms in which chlorine is stored.

(8) Hoops for acid storage tanks. Hoops of tanks shall be made of rods rather than flat strips and shall be safely maintained by scheduled inspections.

(9) Turpentine systems and storage tanks. Nonsparking tools and ground hose shall be used when pumping out the tank. The tank shall be surrounded by a berm or moat. Drainage or diking of tanks shall comply with the general safety and health standards, WAC 296-24-33005.

[Order 76-7, § 296-79-240, filed 3/1/76; Order 74-24, § 296-79-240, filed 5/6/74; Order 70-6, § 296-79-240, filed 7/10/70, effective 8/10/70.]

WAC 296-79-250 Safety procedure for handling dry sulfur. (1) Sulfur burners. Sulfur-burner houses shall be safely and adequately ventilated, and every precaution shall be taken to guard against dust, explosion hazards and fires, in accordance with American National Standards Z9.2-1960 and Z12.12-1968.

(a) Nonsparking tools and equipment shall be used in handling dry sulfur.

(b) Sulfur storage bins shall be kept free of sulfur dust accumulation, and buildings should be designed with explosion relief, in accordance with American National Standard Z9.2-1960.

(c) Electrical equipment shall be of the explosion-proof type, according to the safety standard for installing electric wires and equipment, chapter 296-24 WAC Part L, general safety and health standards.

(d) Sulfur-melting equipment shall not be located in the burner room.

[Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-79-250, filed 11/22/91, effective 12/24/91; Order 76-7, § 296-79-250, filed 3/1/76; Order 74-24, § 296-79-250, filed 5/6/74; Order 70-6, § 296-79-250, filed 7/10/70, effective 8/10/70.]

WAC 296-79-255 Safety procedure for handling liquid sulfur. (1) Each facility utilizing liquid sulfur shall carefully examine its own handling system and formulate a written procedure for maintenance, receiving, storing and using this product. Minimum requirements for the procedure shall be as follows:

(a) Maintenance personnel and all personnel who work at unloading or usage points shall be adequately trained to recognize the dangers of escapement from the system and first aid practices to be followed in the event of exposure.

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(b) Adequate protective equipment (gloves, goggles, etc.) and respiratory protective equipment shall be provided at appropriate locations and personnel who reasonably could be exposed shall be trained in the proper use of these items.

(c) A minimum of two trained employees shall be assigned when a tank car is first opened in preparation for venting and unloading. Approved respiratory protective equipment for H₂S exposure, chemical splash goggles and gloves shall be worn when performing this work. Spark producing or electric operated tools shall not be used to unplug railroad car vents.

(d) Where venting can cause harmful exposure to other unprotected workers in the area, a venting system shall be installed which adequately contains any gas escapement from a tank car while venting. The vented gas shall be carried to a safe location for discharge or circulated through a scrubbing system. The venting system shall be connected before valves which would allow escapement are opened.

(e) No smoking, open burning or welding shall be permitted while unloading is in process or danger of gas escapement exists.

(2) Maintenance.

(a) Any maintenance which involves opening a part of the handling system shall be attempted only after purging that portion of the system as completely as is practical.

(b) All sources of possible contamination into the purged section shall be isolated by valving off or blank flanging. The lockout-tagout procedures contained in WAC 296-79-220 of this chapter, shall be followed.

(c) When opening the system, protective equipment shall be worn by the person or persons involved until such time as the equipment is proven to be free of contamination in harmful quantity.

(d) The danger of heating any portion of the system shall be carefully explained to maintenance crews. Adequate safety procedures shall be followed if heating, welding or cutting are to be attempted.

(e) Any maintenance requiring entry into a portion of the system shall be done in compliance with WAC 296-79-230 of this chapter.

[Order 74-24, § 296-79-255, filed 5/6/74.]

WAC 296-79-260 Pulpwood storage and handling. (1) Proper piling of logs. Logs shall be piled or removed in an orderly manner. The piles shall be stable and individual logs properly placed to prevent them from rolling or falling. The ends shall not project into walkways, roadways or areas reserved for other purposes and sufficient clearance shall be maintained for safe travel of all vehicles and loads.

(2) Prohibited use of wire rope doglines. Wire rope doglines used for towing or rafting shall not be used when:

(a) They acquire jiggers to the extent that they present a hazard to the employees handling them; or

(b) When they are weakened to the extent that they are hazardous.

(3) Boom stick to support weight. Boom sticks shall be capable of safely supporting the weight imposed upon them.

(4) Stiff boom construction. Stiff booms shall be made by fastening not less than two boom sticks together. The width of the stiff boom shall be not less than 36" measured

from outside to outside of the outer logs. The boom sticks shall be fastened together with not less than 4" by 6" cross ties or cable lashing properly recessed into notches in the boom sticks and secured.

(5) Pike poles. Pike poles shall be kept in good repair. Conductive pike poles shall not be used when it is possible that they may come in contact with electrical conductors.

(6) Logs not to be lifted over employees. Logs shall not be lifted over employees and employees shall stay clear of the hazardous area near where logs are being lifted or swung.

(7) Log storing or sorting in water. Storing or sorting on water or any boom work other than boom boat operations, shall require a minimum of two persons.

(8) Overhead protection on mobile equipment. All mobile equipment used to handle logs, blocks or cants shall be provided with adequate overhead protection.

(9) Arrangement of unloading lines. Unloading lines shall be so arranged that it is not necessary for the worker to attach them on the pond or dump side of the load.

(10) Unauthorized traffic prohibited. Unauthorized vehicles and unauthorized foot traffic shall not be allowed in any active sorting, storing, loading, or unloading areas.

(11) Safe movement of equipment. Log unloaders shall not be moved about the premises with loads raised higher than absolutely necessary.

(12) High visibility jackets or vests required. Jackets or vests of fluorescent or other high visibility material shall be worn by persons working on dry land log storage.

(13) Dumps to be cleaned. All log dumps shall be periodically cleared of bark and other debris.

(14) Hand tools. Handles of wood hooks shall be locked to the shank to prevent them from rotating.

[Order 74-24, § 296-79-260, filed 5/6/74; Order 70-6, § 296-79-260, filed 7/10/70, effective 8/10/70.]

WAC 296-79-270 Pulpwood preparation—Scope and application. All sections of this chapter which include WAC 296-79-270 in the section number apply to pulpwood preparation.

[Order 74-24, § 296-79-270, filed 5/6/74; Order 70-6, § 296-79-270, filed 7/10/70, effective 8/10/70.]

WAC 296-79-27001 Barkers, chippers, and hog feed devices. (1) Barker feeding devices shall be designed in such a manner that the operator will not be required to hold or make any physical contact with any log or bolt during the barking operations.

(2) Walkways or floors alongside the drum of any barker shall be equipped with standard guardrails on each side exposed to the drum.

(3) Employees shall not enter any hazardous area in or around a barker until the main disconnect switch has been opened and locked or tagged out and the switch has been tried to assure that the equipment is de-energized.

(4) A dog or locking device in addition to the motor switch, clutch, belt shifter or other power disconnecting device shall be installed on all intermittent barking drums to prevent the drum from moving while it is being filled or emptied.

(5) Hydraulic barkers.

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(a) The inlet and outlet areas of hydraulic barkers shall be equipped with baffles or devices which will reasonably prevent material from flying out while the machine is in operation.

(b) The operator shall be protected by at least five-ply laminated glass or material of equivalent strength.

(6) When changing knives in a barker, chipper or hog, the main disconnect switch shall be opened and locked or tagged out.

(7) The high pressure hoses of hydraulic barkers shall be secured in such a manner that the hose connection ends will be restrained if a hose connection fails.

(8) The feed operator's station shall not be in direct line with the chipper blades. Suitable safeguards shall be installed to prevent chips or chunks from being thrown out and striking the person feeding the machine.

(9) The feed entrance shall be barricaded by means of a standard height guardrail so as to prevent anyone from falling into the chipper.

(10) When the operator cannot readily observe the material being fed into the chipper, a mirror shall be installed in such a position that the ingoing material can be observed.

(11) Safety belts with lifelines attached and face protection shall be worn by employees who manually feed material or clear jams in machines unless other provisions are made which will protect the employees.

(12) Iron bars shall not be used to clear jams or plug-up at the feed entrance to a chipper or hog while the machine is running.

(13) Speed governor. Water wheels, when directly connected to marker disks or grinders, shall be provided with speed governors, if operated with gate wide open. Water wheels directly connected to pulp grinders shall be provided with speed governors limiting the peripheral speed of the grinder to that recommended by the manufacturer.

(14) Knot cleaners. The operators of knot cleaners of the woodpecker type shall wear eye protection equipment. Knot cleaners of the woodpecker type should be enclosed to protect passersby from flying chips.

[Order 74-24, § 296-79-27001, filed 5/6/74.]

WAC 296-79-27003 Log hauls, slips, and carriages.

(1) Controls shall be arranged to operate from a position where the operator will at all times be in the clear of logs, machinery, lines, and rigging. Controls shall be marked to indicate their function.

(2) A guard shall be provided to prevent logs from rolling off the log deck into the well.

(3) When needed for protection of personnel, an automatic stop or interlocking device shall be installed on log hauls or slips.

(4) A barricade or other positive stop of adequate strength shall be provided to protect the sawyer from rolling logs.

(5) Canting gear or other equipment shall not be allowed to hang over the log deck in such a manner as to endanger employees.

(6) Canting gear controls shall be marked to indicate their function.

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(7) The sawyer shall be primarily responsible for the safety of the carriage crew and offbearers. He shall exercise due care in the operation of the carriage and log turning devices.

(8) Feed works and log turning control levers shall be so arranged that they may be secured when not in use and shall be adequately guarded against accidental activation.

(9) A control device shall be provided so that the sawyer may stop the head rig section of the mill without leaving his stand.

(10) An effective method of disengaging the head rig saws from the power unit shall be installed on all head rigs where the power unit is not directly controlled by the sawyer. The saws shall be disengaged from the source of power and locked or tagged out before repairs or changes are made.

(11) The sawyer shall be safeguarded either by his location or by use of substantial screens or approved safety glass.

(12) Carriages upon which persons are required to work shall be solidly decked over and the employee properly protected.

(13) The feed control lever of friction or belt-driven carriage feed works shall be designed to operate away from the saws or carriage track.

(14) A substantial stop or bumper shall be installed at each end of the carriage run.

(15) Substantial sweeps shall be installed in front of each carriage wheel. Such sweeps shall extend to within 1/4 inch of the rails.

(16) Where power-operated log turners are used, carriage knees shall be provided with goosenecks or other substantial means of protecting the carriage crew.

[Order 74-24, § 296-79-27003, filed 5/6/74.]

WAC 296-79-27005 Band saws. (1) Band saws shall be given a thorough daily inspection and any deficiency reported and corrected.

(2) Any band saw found to have developed a crack greater than one-tenth the width of the saw shall be removed from service until the width of the saw is reduced to eliminate the crack, the cracked section is removed, or the development of the crack is arrested by welding.

(3) Band saws shall not be continued in use on the head rig for which they have been designed after they have been reduced 40% in width.

(4) Band saw guides shall be maintained in good condition and proper alignment at all times.

(5) All head band saw wheels shall have a minimum rim thickness of 5/8", except for a distance not to exceed one inch from the front edge of the wheel.

(6) Band saws shall not be run at a speed in excess of the manufacturer's recommendations.

(7) A band wheel that has developed a crack in the rim shall be immediately removed from service. If a crack has developed in a spoke, the wheel shall be removed from service until properly repaired.

(8) All band wheel guards shall be constructed of not lighter than ten U.S. Gauge metal, or not less than two-inch wood material or equivalent, attached to substantial frames. Necessary ventilating ports, not larger than two by four

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inches, and suitable doors or gates for the lubrication and repair of the saw will be permitted.

(9) Every band mill shall be equipped with a saw catcher, rest or guard of substantial construction.

(10) Each gang ripper of band or straight saw type shall have the cutting edges of the saw guarded by a hood or screen substantially secured to the framework of the machine.

[Order 74-24, § 296-79-27005, filed 5/6/74.]

WAC 296-79-27007 Circular saws speeds and repairs. (1) Circular saws shall not be operated at speeds in excess of those specified by the manufacturers.

(2) Circular saws shall be inspected for cracks each time the teeth are filed or set. They shall be discontinued from use until properly repaired when found to have developed a crack exceeding the safe limits specified by the manufacturer.

(3) Damaged saws shall be repaired only by persons experienced and knowledgeable in this type of work or by a manufacturer's representative.

[Order 74-24, § 296-79-27007, filed 5/6/74.]

WAC 296-79-27009 Slasher saws-tables. (1) Slasher saws shall be guarded in accordance with WAC 296-79-030(4) of this chapter.

(2) Saws shall be stopped and locked or tagged out whenever it is necessary for any person to be on the slasher table.

(3) Saws below table where not protected by the frame of the machine, the underside of the slasher saws shall be adequately guarded.

[Order 74-24, § 296-79-27009, filed 5/6/74.]

WAC 296-79-27011 Circular swing saws. (1) Each circular swing saw shall be provided with a hood guard that completely encloses the upper half of the saw.

(2) Each swing saw shall be equipped with a positive stop at the extent of the swing necessary to cut the material.

[Order 74-24, § 296-79-27011, filed 5/6/74.]

WAC 296-79-27013 Drag saws—Fixed chain saws—Circular cut-off saws. (1) Saws shall be so arranged that they will not project into any passageway when in an idle or working position. When existing conditions do not leave clear passage the saws shall be fenced off in order to make it impossible for anyone to walk into them.

(2) Log decks shall be equipped with a device to hold the material stable when being cut.

(3) Drag saws and fixed chain saws shall be equipped with a device that will safely lock them in an "up" position.

(4) All persons shall be in the clear before starting operations of a drag-chain or swing saw.

[Order 74-24, § 296-79-27013, filed 5/6/74.]

WAC 296-79-27015 Construction and use of pulp-wood splitters. (1) The activating control unit for a splitter shall be of the clutch or positive acting type and shall be so arranged and designed that it will not repeat without additional activation before starting a second cycle.

(2) The base or rest upon which the wood seats while being split shall have a corrugated surface or other means

shall be provided which will prevent the wood block or log from shifting as the pressure is applied.

(3) The splitter base or rest and wood to be split shall be free of ice, snow, and chips.

(4) The splitter machine operator shall have a clear, unobstructed view of the work area adjacent to the splitting operation when other workers must be in such area while blocks are being split.

[Order 74-24, § 296-79-27015, filed 5/6/74.]

WAC 296-79-280 Chip and hog fuel storage. (1) Entry into bins and silos.

(a) No worker shall be permitted to enter a bin unless provided with a safety belt, with line attached, and an attendant stationed at the bin to summon assistance.

(b) Before entry into chip bins and silos, all applicable rules under vessel entry, WAC 296-79-230, of this chapter, shall be complied with.

(c) Chip and sawdust bins. Steam or compressed air lances, or other facilities, shall be used for breaking down the arches caused by jamming in chip lofts.

(d) Employees shall be prohibited from working under overhangs or bridges. Extreme care shall be taken to prevent chips or hog fuel from creating an overhang or bridging.

(e) Hog fuel bins shall be provided with an approved railed platform or walkways near the top or other approved means shall be provided for use of employees engaged in dislodging hog fuel.

(2) Exterior chip and hog fuel storage. When mobile equipment is used on top of hog fuel or chip piles, a roll-over protection system shall be installed on the equipment. If the cab is of the enclosed type, windshield wipers shall be installed. If used during hours of darkness the area shall be adequately illuminated or the equipment shall have adequate lights to provide the operator sufficient illumination to safely perform the work.

[Order 74-24, § 296-79-280, filed 5/6/74; Order 70-6, § 296-79-280, filed 7/10/70, effective 8/10/70.]

WAC 296-79-290 Stock preparation and reprocessing—Scope and application. All sections of this chapter which include WAC 296-79-290 in the section number apply to stock preparation and reprocessing.

[Order 74-24, § 296-79-290, filed 5/6/74; Order 70-6, § 296-79-290, filed 7/10/70, effective 8/10/70.]

WAC 296-79-29001 Digester valves and piping. The blow valve of a digester shall be arranged so as to be operated from another room, remote from safety valves.

(1) Digester piping shall meet the criteria of the boiler and pressure vessel standards.

(2) Heavy duty pipe, valves, and fittings shall be used between the digester and blow pit. These valves, fittings, and pipes shall be inspected at least semiannually to determine the degree of deterioration and should be replaced when necessary.

(3) Digester blow valves or controls shall be pinned or locked in closed position throughout the entire cooking period.

[Order 74-24, § 296-79-29001, filed 5/6/74.]

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WAC 296-79-29003 Warning of digester being blown. Audible warning signals and red warning lights shall be installed in areas which may be hazardous to personnel while digesters are being blown. Such devices shall be activated prior to blowing a digester and the warning lights shall remain lighted as long as the hazard exists.

(1) Blowing digester. Blow-off valves shall be opened slowly.

(2) After the digester has started to be blown, the blow-off valve shall be left open, and the hand plate shall not be removed until the person responsible signals the blow-pit person that the blow is completed. Whenever it becomes necessary to remove the hand plate to clear stock, operators shall wear eye protection equipment and protective clothing to guard against burns from hot stock.

(3) In addition to the vessel entry procedure of WAC 296-79-230, of this chapter, the blow-pit door or hatch shall be locked open whenever a person is in the blow-pit.

(4) Blow-pit hoops shall be maintained in a safe condition.

(5) Where the processes of the sulfate and soda operations are similar to those of the sulfite processes, the standard of WAC 296-79-29001 and 296-79-29003, of this chapter, shall apply to both processes.

(6) At least one unobstructed exit at each end of the room shall be provided on each floor of a digester building.

(7) Means shall be provided whereby the digester cook shall signal the man in the chip bin before starting to load the digester.

[Order 77-12, § 296-79-29003, filed 7/11/77; Order 76-7, § 296-79-29003, filed 3/1/76; Order 74-24, § 296-79-29003, filed 5/6/74.]

WAC 296-79-29005 Unplugging quick lime stoppages. Water shall not be used to unplug quick lime stops or plugs in pipes or confined spaces.

[Order 74-24, § 296-79-29005, filed 5/6/74.]

WAC 296-79-29007 Bleach plant. (1) Work areas used for preparation and processing of bleaching mixtures shall be equipped with properly designed exhaust ventilation systems capable of clearing the area of toxic gases.

(2) Bleaching containers, such as cells, towers, etc., except the Bellmer type, shall be completely covered on the top, with the exception of one small opening large enough to allow filling but too small to admit a person. This opening should be covered by a door and guarded with standard guardrail and toeboards. Platforms leading from one engine to another shall have standard guardrails in accordance with the general safety and health standards, WAC 296-24-75007.

[Order 74-24, § 296-79-29007, filed 5/6/74.]

WAC 296-79-29009 Audible alarm in bleach plant. An audible alarm system shall be installed and it shall be activated whenever a serious leak or break develops in the bleach plant area which creates a health or fire hazard.

[Order 74-24, § 296-79-29009, filed 5/6/74.]

WAC 296-79-29011 Pocket grinder doors. Doors of pocket grinders shall be so designed and arranged as to keep them from closing accidentally.

[Order 74-24, § 296-79-29011, filed 5/6/74.]

WAC 296-79-29013 Pulping device procedures. Each company shall develop a safe procedure which shall be followed for feeding, clearing jams, or removing foreign objects from any pulping device. These procedures shall comply with applicable provisions of this standard.

[Order 74-24, § 296-79-29013, filed 5/6/74.]

WAC 296-79-29015 Off machine repulping devices.
(1) When fed manually from the floor above, conveniently located emergency stop devices shall be provided at the top level.

(2) When fed from floor above, the chute opening, if less than standard guardrail height from the feed platform or floor, shall be provided with a complete guardrail or other enclosure to standard guardrail height. Openings for manual feeding shall be sufficient only for entry of stock and shall be provided with at least two permanently secured crossrails, in accordance with, the general safety and health standards, WAC 296-24-75003.

[Order 74-24, § 296-79-29015, filed 5/6/74.]

WAC 296-79-29017 Pulping device cleaning, inspection and repairing. When cleaning, inspecting or other work requires that persons enter pulping devices, all control devices shall be locked or tagged out in accordance with the requirements of this standard.

[Order 74-24, § 296-79-29017, filed 5/6/74.]

WAC 296-79-29019 Guarding hand knives and sharpening steels. Hand knives and sharpening steels used in rag and old paper preparation, shall be provided with guards at the junction of the handle and the blade. Stanley-type utility knives with blade exposure 2 1/2 inches or less are exempted from this requirement.

[Order 74-24, § 296-79-29019, filed 5/6/74.]

WAC 296-79-29021 Shredders and blowers. On manually fed broke shredders [shredders], the feed table shall be of such height and distance from the knives as to prevent the operator from reaching or falling into the knives or the operator shall be safeguarded by other acceptable means.

(1) A smooth-pivoted idler roll resting on the stock or feed table shall be provided in front of feed rolls except when arrangements prevent the operator from standing closer than 36 inches to any part of the feed rolls.

(2) Any manually fed cutter, shredder, or duster shall be provided with an idler roll as specified in (1) of this section or the operator shall use special hand-feeding tools.

(3) Hoods of cutters, shredders, and dusters shall have exhaust ventilation, in accordance with American National Standard Z9.2-1960 and chapter 296-62 WAC, general occupational health standards.

(4) Blowers used for transporting rags shall be provided with feed hoppers having outer edges located not less than 48 inches from the fan.

(5) The arrangement of the blower discharge outlets and work areas shall be such as to prevent material from falling on workers.

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[Order 74-24, § 296-79-29021, filed 5/6/74.]

WAC 296-79-29023 Clearing shredder jams. To clear jams or blockage to the machine, the operator shall use objects which will not create a hazard. The use of metal bars for such purposes is prohibited.

[Order 74-24, § 296-79-29023, filed 5/6/74.]

WAC 296-79-29025 Repairing shredders. Repairs shall be done only when the shredder is shut down and the control devices are locked or tagged out in accordance with the requirements of this standard.

[Order 74-24, § 296-79-29025, filed 5/6/74.]

WAC 296-79-29027 Guillotine type roll splitters. (1) The engaging control for activating the guillotine blade shall be a positive two-hand operating control or located far enough from the cutting location so that the operator cannot reach the blade during the cutting process. In either control method, "deadman type" switch gear which demands continuous operator activation shall be installed and used.

(2) Personnel shall not position any part of the body under the blade.

(3) Rolls shall be in the horizontal position while being split.

(4) Rolls shall be centered directly below the blade.

[Order 76-7, § 296-79-29027, filed 3/1/76; Order 74-24, § 296-79-29027, filed 5/6/74.]

WAC 296-79-29029 Broke hole. (1) An alarm bell or flashing light shall be actuated or other suitable warning shall be given before dropping material through a broke hole when persons working below may be endangered.

(2) Broke holes shall be guarded to the fullest extent possible consistent with operational necessities. The degree of guarding provided by standard height and strength guardrails will be considered as a minimum acceptable level of protection.

(3) When repulping devices or feed conveyor systems for repulping devices are located beneath broke holes, special precautions shall be used. The broke hole opening shall be reduced to the smallest practical dimension. If such broke hole opening must be large enough to permit a worker to fall through and the opening is not guarded at least to the equivalent degree of protection provided by standard guardrails, any employee pushing broke down the broke hole shall wear a safety belt attached to a safety belt line. The safety belt line shall be fastened in such a manner that it is impossible for the person to fall into the repulping device.

(4) Guarding to the equivalent degree of protection provided by standard guardrails and meeting the requirements of subsections (2) and (3), may be achieved by the use of guard bars separated no more than 15-1/2 inches in a vertical plane and 12 inches in a horizontal plane, or any other location within that segment.

[Statutory Authority: RCW 49.17.040, 49.17.240, and chapters 43.22 and 42.30 RCW. 81-03-007 (Order 80-31), § 296-79-29029, filed 1/8/81; Order 74-24, § 296-79-29029, filed 5/6/74.]

WAC 296-79-29031 Industrial kiln guns and ammunition. Management shall develop written instructions,

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including safety procedures, for storing and operating industrial kiln guns and ammunition. All personnel working with this equipment shall be instructed in these procedures and shall follow them.

[Order 74-24, § 296-79-29031, filed 5/6/74.]

WAC 296-79-29033 Chlorine dioxide system. (1) Sodium chlorate.

(a) Personnel handling and working with sodium chlorate shall be thoroughly instructed in precautions to be used in handling and special work habits. Refer to Manufacturing Chemists Association Chemical Data Sheet No. SD-42 (Sodium Chlorate).

(b) Personnel exposed to direct contact with sodium chlorate shall wear neoprene or other special protective clothing and special footwear.

(c) Facilities for storage and handling of sodium chlorate shall be constructed so as to eliminate possible contact of dry or evaporated sodium chlorate with wood or other material which could cause a fire or explosion. Refer to Manufacturing Chemists Association Chemical Data Sheet No. SD-42 (Sodium Chlorate).

(d) Sodium chlorate facilities should be constructed with a minimum of packing glands, stuffing boxes, etc. Refer to Manufacturing Chemists Association Chemical Data Sheet No. SD-42 (Sodium Chlorate).

(2) Chlorine dioxide.

(a) Chlorine dioxide generating and storage facilities shall be placed in areas which are adequately ventilated and are easily kept clean of wood, paper, pulp, etc., to avoid contamination which might cause a reaction. This can be accomplished by placing these facilities in a separate room or in a designated outside space.

(b) Only authorized personnel shall be allowed in close proximity to the chlorine dioxide generating equipment. The generating area shall have signs warning of the hazard and restricting entrance to authorized personnel only.

(c) When reasonably possible, the sample station should be located on the outside of the generating room. Goggles must be worn when taking samples.

(d) Two alternate direction exits shall be provided from the generator working areas.

(3) General.

(a) Safety showers and/or jump tanks and eye wash facilities shall be provided for persons working around sodium chlorate and the other hazardous chemicals involved in this process.

(b) Water hoses for flushing spills shall be adequate in size and located where needed.

(c) All equipment involved in this process where pressure may be generated shall be provided with adequate pressure relief.

(d) Welding or burning shall not be performed on the generator system while it is operating. Immediately before maintenance can be performed on the inside of any of this equipment, it shall be thoroughly flushed with water and purged of hazardous gases.

(e) Respiratory protective equipment approved for use in chlorine and chlorine dioxide exposures shall be provided at appropriate locations.

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(f) Facilities handling sodium chlorate and chlorine dioxide shall be declared "no smoking" areas and shall have signs posted accordingly.

(g) Management shall be responsible for developing written instructions including safety procedures for operating and maintaining the generator and associated equipment. All personnel working on this equipment shall be thoroughly trained in these procedures and shall follow them. A periodic review of these procedures is recommended.

[Order 74-24, § 296-79-29033, filed 5/6/74.]

WAC 296-79-29035 Piling and unpling pulp. (1) Piles of wet lap pulp (unless palletized) shall be stepped back one-half the width of the sheet for each 8 feet of pile height. Sheets of pulp shall be interlapped to make the pile secure. Pulp shall not be piled over pipelines to jeopardize pipes, or so as to cause overloading of floors, or to within 18 inches below sprinkler heads.

(2) Piles of pulp shall not be undermined when being unplied.

(3) Floor capacities shall be clearly marked on all floors.

(4) Baled paper and rags shall be stored in stable piles which do not extend into the area necessary for the proper function of sprinkler systems, where sprinklers are used for fire protection in the storage area.

[Order 76-7, § 296-79-29035, filed 3/1/76; Order 74-24, § 296-79-29035, filed 5/6/74.]

WAC 296-79-29037 Chocking rolls. (1) Where pulp or paper rolls are of uniform size, cribbing should be constructed to keep rolls from moving.

(2) Where rolls are stacked and not nested two or more high, chocks shall be installed between each roll on the floor and at every row. The face of each chock should be formed on a radius to conform to the average roll size in use, and the chock shall prevent roll movement.

(3) When rolls are decked two or more high, the bottom rolls shall be chocked on each side to prevent shifting in either direction.

(4) A supply of portable roll chocks should be available to be used where there are gaps in the bottom row of rolls. These should be as light as possible while still providing maximum blocking effect.

[Order 74-24, § 296-79-29037, filed 5/6/74.]

WAC 296-79-300 Machine room equipment and procedures. (1) Lock-out and tag-out procedures to be followed. Lock-out and tag-out requirements and procedures contained in these standards shall be complied with.

(2) Emergency stopping controls. Pulp and paper machines shall be equipped with emergency stopping control(s) which can be actuated quickly from all normal operating stations. If useful for the safety of personnel, the stopping control(s) shall be interlocked with adequate retarding or braking action to stop the machine as quickly as is practical.

(3) Walkways. Steps and footwalks along the fourdrinier and press section shall have nonslip surfacing and be complete with standard handrails, when practical.

(4) Machine lubrication. If a machine must be lubricated while in operation an automatic lubricating device shall be

provided or oil cups and grease fittings shall be provided which can be serviced safely without exposing the worker to any hazards.

(5) Weights on levers. All levers carrying weights shall be so constructed that weights will not slip or fall off.

(6) Guarding inrunning nip points.

(a) The drums on pulp and paper machine winders shall be provided with suitable guards to prevent a person from being caught between the roll and the front drum on the winder when the pinch point is on the operator's side. Any such guard shall be interlocked with the drive mechanism to prevent the winder from running while the guard is not in place except that the winder may be wired to allow it to run at a slow speed only for adjustment and start-up purposes while the guard is not in position. A zero speed switch or locking device shall be installed to prevent the guard from being removed while the roll is turning.

Paper machine winders when used to produce rolls of 15 inches or less in diameter may be exempted from this subsection but must comply with the provisions of (6)(b).

(b) Rewinders.

(i) When rewinding large rolls and the nip point is adjacent to the normal work area, the nip point shall be protected by a barrier guard. Such guard shall be interlocked with the drive mechanism to prevent operating the machine above jog speed without the guard in place. A zero speed switch shall be installed to prevent the guard from being raised while the roll is turning.

(ii) On small rolls 15 inches or less in diameter where barrier guards are impractical they shall not be required if the nip point is separated from the employees by at least 18" while operating at more than jog speed. When the rewinder is running at more than jog speed no worker shall place any part of their body closer than 18" from the nip.

(c) Inrunning nips where paper is not being fed into a calender should be protected by barriers.

(7) Audible alarm in dryer section. An audible alarm shall be sounded prior to starting up any section of a pulp or paper machine. Sufficient time shall be allowed between activation of the alarm system and start-up of the equipment to allow any persons to clear the hazardous area.

(8) Starting up dryer section. In starting up a dryer section, steam to heat the drums shall be introduced slowly and while the drums are revolving.

(9) Starting paper into nip. When starting paper into the nip of drum type reels or calender stacks a safe method shall be used. This may be accomplished by the use of feeder belts, carrier ropes, air carriage or other device or instrument. A rope carrying system should be used wherever possible at points of transfer. Sheaves should be spaced so that they do not create a nip point with each other and the sheave and its support should be capable of withstanding the speed and breaking strength of the rope for which they are intended.

(10) Feeding stack with hand held device. Employees shall not feed a stack with any hand held device which is capable of going through the nip.

(11) Broken carrier rope. Employees shall not attempt to remove a broken carrier rope from a dryer while the section is running at operating speed.

(12) Removing a wrap. Employees shall stop dryer to remove a wrap except in cases where it can be safely removed by using air or other safe means.

(13) Deposits on rolls. To remove deposits from rolls, a specially designed scraper or tool shall be used. Scraping of rolls shall be performed on the outgoing nip side.

(14) Cleaning doctor blades. Employees shall not place their hands between the sharp edge of an unloaded doctor blade and the roll while cleaning the doctor blade.

(15) Sharp edges of doctor blades to be covered. Doctor blades shall have the sharp edges properly guarded during transportation and storage.

(16) Handling doctor blades. Special protective gloves shall be provided and shall be worn by employees when filing or handling sharp edged doctor blades.

(17) Steps, platforms or walkways for calender stacks. When steps, platforms, or walkways are necessary to perform work on calender stacks they shall have nonskid type surfaces. Guardrails shall be installed where possible.

(18) Lifting reels.

(a) Reels shall stop rotating before being lifted away from reel frame.

(b) All lifting equipment (clamps, cables, and slings) shall be maintained in a safe condition and inspected regularly.

(c) Exposed rotating reel shafts with square block ends shall be guarded.

(19) Reels to be properly seated. The crane operator shall ascertain that reels are properly seated at winder stand or at reel arms before they disengage the hooks.

(20) Space between reels. On stack reels, a clearance of at least 8 inches between the reels of paper shall be maintained.

(21) Set screws. Set screws for securing core collars to winding and unwinding shafts shall not protrude above the face of the collar. All edges of the collar that an operator's hand may come in contact with shall be beveled to remove all sharp corners.

(22) Properly set up core cutting device. The worker shall make certain that any core cutting device is properly set up and guard is in proper position before using the machine.

(23) Winder shaft. All winder shafts should be equipped with a winder collar guide. The winder should have a guide rail to align the shaft for easy entrance into the opened rewind shaft bearing housing. If winder shafts are too heavy for manual handling, mechanical equipment shall be used.

(24) Barrier guards for shaftless winders. Shaftless winders shall be provided with a barrier guard of sufficient strength and size to confine the rolls in the event they become dislodged while running.

(25) Grounding. All calender stacks and spreader bars shall be grounded according to chapter 296-24 WAC Part L as protection against shock induced by static electricity.

(26) Sole plates. All exposed sole plates between dryers, calenders, reels and rewinders shall have a nonskid type surface.

(27) Nonskid type surface required. A nonskid type surface shall be provided in the work areas around the winders or rewinders. Areas in front of the winder shall be kept clear

of oil, broke, and other debris that may cause workers to slip, trip, or fall.

(28) Roll lowering table. If a powered roll ejector is used it should be interlocked to prevent accidental actuation until the receiving platform or roll lowering table is in position to receive the roll.

(29) Lowerator. Employees shall keep clear of hazardous areas around the lowerator, especially all lowerator openings in a floor and where roll is being discharged.

(30) Rider rolls. Provision shall be made to hold the rider roll when in a raised position unless counterbalancing eliminates the hazard.

(31) Gas hood entry procedures. Whenever an employee is inside a gas hood they shall be accompanied by another worker or a person shall be stationed near the entrance.

(32) Drain openings in pits. Flush floor drain openings larger than 3" in diameter in the bottom of pits shall be guarded to prevent workers from stepping through, while working in this area.

[Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-79-300, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW 49.17.040, 49.17.240, and chapters 43.22 and 42.30 RCW. 81-03-007 (Order 80-31), § 296-79-300, filed 1/8/81; Order 76-7, § 296-79-300, filed 3/1/76; Order 74-24, § 296-79-300, filed 5/6/74; Order 70-6, § 296-79-300, filed 7/10/70, effective 8/10/70.]

WAC 296-79-310 Converting operations (bag and container manufacturing, printing, coating, finishing and related processes)—Scope and application. All sections of this chapter which include WAC 296-79-310 in the section number apply to converting operations (bag and container manufacturing, printing, coating, finishing and related processes).

[Order 74-24, § 296-79-310, filed 5/6/74; Order 70-6, § 296-79-310, filed 7/10/70, effective 8/10/70.]

WAC 296-79-31001 General requirements. (1) Applicable rules of this standard to prevail. Rules contained in this standard shall prevail where applicable to converting operations.

(2) Use of both hands required to activate guillotine trimmers. Guillotine-type trimmers shall be designed in a manner which will require the operator to use both hands simultaneously to activate the cutting blade. If machine helpers are employed in the control function of the cutter, separate two-hand controls shall be provided for the control function performed by the helper.

(3) Nonrepeat device required for guillotine trimmers. Guillotine-type trimmers shall be designed in a manner that the trimming blade will not repeat unless manually reactivated.

(4) Sorting and counting tables. Tables shall be smooth and free from splinters, with edges and corners rounded.

(a) Paddles shall be smooth and free from splinters.

(5) Mirrors should be installed to assist the converting machine operator in viewing blind work stations where a hazard exists.

(6) Mechanical lifting devices shall be provided for placing and removing rolls from rewinders. Rolls shall not be left suspended overhead while the controls are unattended.

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(7) Rolls handled by cranes or hoists shall not be handled over the heads of workers.

(8) When using a crane or hoist to place rolls into a backstand and the operator cannot see both ends of the backstand, assistance will be provided or appropriate devices will be installed to eliminate the hazards involved. The operator shall ascertain that rolls are properly seated at winder stand or at roll arms before he disengages the hooks.

(9) Slitters, slotters, and scorers not in use shall be properly stored as not to create a hazard.

(10) All power closing sections shall be equipped with an audible warning system which will be activated when closing the sections.

(11) Roll-type embosser. The nipping point located on the operator's side shall be guarded by either automatic or manually operated barrier guards interlocked with the drive.

[Order 76-7, § 296-79-31001, filed 3/1/76; Order 74-24, § 296-79-31001, filed 5/6/74.]

WAC 296-79-31003 Corrugator. (1) Every recessed floor conveyor system shall be identified by standard color coding, and so designed and installed to minimize tripping hazards.

(2) All areas subject to wet processes shall be provided with drains.

(a) Drain trenches shall be provided with gratings flush with the adjoining floor.

(b) Use of curbing in work areas should be avoided in new installations. If the use of curbing cannot be avoided, the design shall be such that the curbs do not constitute a tripping hazard in normal working areas. When curbing exists and constitutes a hazard, it shall be color coded.

(3) Rails of rail mounted devices such as roll stands shall be flush with the adjacent floor, and so installed to provide a minimum of 18" clearance between the equipment and walls or other fixed objects.

(4) All corrugating and pressure rolls shall be equipped with appropriately designed and installed threading guides so as to prevent contact with the infeed nip of the various rolls by the operator.

(5) A minimum of 4" clearance shall be maintained between heated drums, idler rolls, and cross shafting on all preheaters and preconditioners.

(6) Lower elevating conveyor belt rolls on the single facer bridge shall have a minimum nip clearance of 4".

(7) Web shears at the discharge end of the double facer shall be equipped with barrier type guards.

(8) Slitter stations not in use shall be disconnected from the power source by positive means.

(9) Elevating type conveyors shall have the floor area color-coded.

[Order 74-24, § 296-79-31003, filed 5/6/74.]

WAC 296-79-31005 Adhesive system. (1) The adhesive system shall be so designed and installed as to keep fumes and airborne dust within limits set by the occupational health standards, chapter 296-62 WAC.

[Order 74-24, § 296-79-31005, filed 5/6/74.]

WAC 296-79-31007 Printing and cutting. (1) Printer slotter.

(a) The in-feed nip shall be guarded to prevent contact with the in-running feed rolls. Shear and pinch points at the feed mechanism shall be color-coded and/or identified by signs.

(b) Employees shall wear eye protection while removing staples from the dies or while adjusting slotter knives.

[Order 74-24, § 296-79-31007, filed 5/6/74.]

WAC 296-79-31009 Die cutting. (1) Bobst type die cutters.

(a) The space where the sheet enters the die shall be guarded to prohibit entry of the operator's hand. If this guard is hinged or otherwise moveable it shall be interlocked to prevent the equipment from moving unless the guard is in the proper position.

(b) A minimum of 4" shall be provided between the end of the slat and the guide bar.

[Order 74-24, § 296-79-31009, filed 5/6/74.]

WAC 296-79-31011 Power lifts on gluers, tapers and stitchers. (1) Elevated operator stands for lifts shall have toe boards on three sides.

[Order 74-24, § 296-79-31011, filed 5/6/74.]

WAC 296-79-31013 Strapping-banding operations.

(1) Eye protection shall be worn when hand strapping or breaking bands.

[Order 74-24, § 296-79-31013, filed 5/6/74.]

WAC 296-79-320 Recovery furnace area requirements. (1) Warning system. An audible warning system shall be installed in kraft and soda base sulfite recovery furnace areas and shall be actuated whenever an emergency exists.

(2) Personnel to be instructed in emergency procedures. All personnel working in recovery furnace areas shall be instructed on procedures to be followed when emergency warning systems are actuated.

(3) Warning system maintenance. Emergency warning systems in the recovery furnace areas shall be kept in proper working condition and shall be tested or checked weekly.

(4) Personnel to stand to side while opening firebox door. Personnel shall stand to the side while opening a furnace or boiler firebox door.

(5) Smelt tanks. Smelt-dissolving tanks shall be covered and the cover kept closed, except when samples are being taken.

[Order 74-24, § 296-79-320, filed 5/6/74; Order 70-6, § 296-79-320, filed 7/10/70, effective 8/10/70.]

Chapter 296-81 WAC

SAFETY RULES GOVERNING ELEVATORS, DUMBWAITERS, ESCALATORS AND OTHER LIFTING DEVICES—MOVING WALKS

WAC

- 296-81-005 National Elevator Codes adopted.
- 296-81-006 National Elevator Code adopted—1967.
- 296-81-007 National Elevator Code adopted.
- 296-81-008 National Elevator Code supplement adopted.
- 296-81-009 National Safety Standard for Manlifts adopted.

[Title 296 WAC—p. 1870]

EXISTING INSTALLATIONS

- 296-81-200 Adoption of elevator codes.
- 296-81-240 Valves.
- 296-81-275 Smoke detectors.
- 296-81-277 Method to achieve ANSI A17.1-102.2 (c)4.
- 296-81-280 Electric conduit pipes and ducts.
- 296-81-290 Underground hydraulic elevator pipes, fittings, and cylinders.
- 296-81-300 Operation and leveling.
- 296-81-306 Door protective and reopening device.
- 296-81-310 Door delay.
- 296-81-315 Car interior.
- 296-81-320 Car controls.
- 296-81-325 Car position indicator signal.
- 296-81-330 Telephone or intercommunicating system.
- 296-81-335 Floor covering.
- 296-81-340 Handrails.
- 296-81-345 Minimum illumination.
- 296-81-350 Door jamb marking.
- 296-81-355 Hall buttons.
- 296-81-360 Hall lantern.
- 296-81-365 Emergency use.
- 296-81-370 Effective date.
- 296-81-990 Advisory board.
- 296-81-991 Civil penalties.

Reviser's note: As a part of Order 70-11, filed 9/18/70, effective date 10/21/70, the administration of chapter 296-81 WAC, Safety rules governing elevators, dumbwaiter, escalator and other lifting devices—Moving walks shall be under the jurisdiction of the division of building and construction safety inspection services of the department of labor and industries.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 296-81-002 Foreword. [Foreword, filed 9/28/64.] Repealed by 82-12-005 (Order 82-18), filed 5/20/82. Statutory Authority: RCW 70.87.030.
- 296-81-003 Waiver and variance. [Waiver and variance, filed 9/28/64.] Repealed by 82-12-005 (Order 82-18), filed 5/20/82. Statutory Authority: RCW 70.87.030.
- 296-81-010 Hoistway enclosures. [Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-024 (Order 86-1), § 296-81-010, filed 1/10/86; Rules 1.010-1.050, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-020 Hoistway gates and doors. [Rules 2.010-2.060, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-030 Car enclosures. [Rule 3.010, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-040 Car doors and gates. [Order 74-31, § 296-81-040, filed 6/14/74; Rules 4.010-4.060, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-050 Brakes. [Rule 5.010, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-060 Car safeties. [Rule 6.010, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-070 Overspeed governors. [Rule 7.010, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-080 Periodic inspections and tests. [Rules 8.010-8.030, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-090 Maintenance inspection and test periods. [Rule 9.010, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-100 Ropes, rope connections, data and record. [Rules 10.010-10.060, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-110 Electric and electro-hydraulic dumbwaiters. [Rules 11.010-11.030, filed 9/28/64.] Repealed by 92-24-065,

- 296-81-120 filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. Hydraulic elevators. [Order 74-31, § 296-81-120, filed 6/14/74; Rule 12.010, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-130 Sidewalk elevators. [Rules 13.010-13.020, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-140 Hand power elevators and dumbwaiters. [Rules 14.010-14.050, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-150 Car operating and terminal stopping devices and electrical protective devices. [Rules 15.010-15.070, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-160 Power supply switch. [Rule 16.010, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-170 Access to machine room and machinery space. [Rule 17.010, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-180 Capacity posting. [Rule 18.010, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-190 Illumination. [Rule 19.010, filed 9/28/64.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-220 Illumination of pits. [Order 73-1, § 296-81-220, filed 4/16/73.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-260 Photo electric or electric eye devices. [Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-024 (Order 86-1), § 296-81-260, filed 1/10/86. Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-81-260, filed 5/20/82; Order 76-37, § 296-81-260, filed 12/3/76; Order 73-1, § 296-81-260, filed 4/16/73.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-270 Counterweight pit guards. [Order 73-1, § 296-81-270, filed 4/16/73.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.
- 296-81-305 Door operation. [Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-305, filed 12/10/80.] Repealed by 92-24-065, filed 12/1/92, effective 1/1/93. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030.

WAC 296-81-005 National Elevator Codes adopted.

(1) American Standard Safety Code for Elevators, Dumbwaiters and Escalators A 17.1 1960 shall apply to all elevators, dumbwaiters, and escalators installed between November 1, 1963, and December 29, 1967.

(2) American Standard Safety Code Rules for Moving Walks A.S.A. 17.1.13 1962 shall apply to all moving walks installed between November 1, 1963, and December 29, 1967.

(3) Part X of A.S.A. A17.1 1960 Maintenance shall apply to installations in existence on November 1, 1963.

[Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-81-005, filed 5/20/82. Prior: Effective 11/1/63.]

WAC 296-81-006 National Elevator Code adopted—1967. USAS Standard A 17.1-1965 "Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks" (Revision and Consolidation of A17.1-1-1960, A17.1a-1963, and A17.1-13-1962) plus Supplement USAS-A17.1a-1967,

(1999 Ed.)

USAS A17.1b-1968, USAS A17.1c-1969 (excluding Appendix E) and ANSI A17.1d-1970 shall apply to all elevators, dumbwaiters, escalators, and moving walks installed from December 30, 1967, through February 24, 1972.

[Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-81-006, filed 5/20/82; Order 70-11, § 296-81-006, filed 9/18/70; filed 12/29/67.]

Reviser's note: The A.S.A. publications are published by the American Society of Mechanical Engineers at 345 47th Street, New York, New York 10017.

WAC 296-81-007 National Elevator Code adopted.

(1) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks, American National Standards Institute A17.1, as amended or revised through 1971, is adopted as the standards in this state for elevators, dumbwaiters, escalators, and moving walks installed from February 25, 1972, through June 30, 1982.

(2) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks, ANSI A17.1, 1981 edition, is adopted as the standard for elevators, dumbwaiters, escalators, and moving walks installed on or after July 1, 1982 through January 9, 1986.

(3) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks, ANSI A17.1, 1984 edition is adopted as the standard for elevators, dumbwaiters, escalators, and moving walks installed on or after January 10, 1986, with the exception of ANSI A17.1, part XIX. For all elevators, dumbwaiters, escalators, and moving walks installed on or after November 1, 1988, the requirements of ANSI A17.1, 1984 edition apply, with the exception of ANSI A17.1, part XIX and ANSI A17.1, part II, Rule 211.3b, which is replaced by WAC 296-81-275.

(4) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks, ANSI A17.1, 1987 edition is adopted as the standard for elevators, dumbwaiters, escalators, and moving walks installed on or after January 1, 1989, with the exception of ANSI A17.1, part XIX, and ANSI A17.1, part II, Rule 211.3b, which is replaced by WAC 296-81-275.

(5) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks, ANSI A17.1, 1990 Edition is adopted as the standard for elevators, dumbwaiters, escalators, and moving walks installed on or after January 1, 1993, with the exceptions of ANSI A17.1, Part XIX, and ANSI A17.1, Part V, Section 513, which is replaced by chapter 296-94 WAC.

(6) The American National Standard Safety Code For Elevators, Dumbwaiters, Escalators, and Moving Walks, ANSI A17.1, 1993 Edition is adopted as the standard for elevators, dumbwaiters, escalators, and moving walks installed on or after March 1, 1995, with the exceptions of ANSI A17.1, Part XIX, and ANSI A17.1, Part V, Section 513, which is replaced by chapter 296-94 WAC.

(7) The 1996 edition of the *American Society of Mechanical Engineers Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks*, AMSE A17.1 (formally known as American National Standard, ANSI A17.1), is adopted as the standard for elevators, dumbwaiters, escalators and other conveyances installed on or after June 30, 1998.

[Statutory Authority: Chapter 70.87 RCW, 98-12-043, § 296-81-007, filed 5/29/98, effective 6/30/98; 95-04-005, § 296-81-007, filed 1/18/95, effective 3/1/95. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030, 92-24-065, § 296-81-007, filed 12/1/92, effective 1/1/93. Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100, 88-19-053 (Order 88-18), § 296-81-007, filed 9/15/88. Statutory Authority: RCW 70.87.030, 87-23-007 (Order 87-21), § 296-81-007, filed 11/6/87. Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100, 86-03-024 (Order 86-1), § 296-81-007, filed 1/10/86. Statutory Authority: RCW 70.87.030 and 70.87.185, 84-23-001 (Order 84-21), § 296-81-007, filed 11/8/84. Statutory Authority: RCW 70.87.185 and 70.87.034, 84-05-005 (Order 83-37), § 296-81-007, filed 2/6/84. Statutory Authority: RCW 70.87.030, 82-12-005 (Order 82-18), § 296-81-007, filed 5/20/82; Order 72-2, § 296-81-007, filed 2/25/72.]

WAC 296-81-008 National Elevator Code supplement adopted. (1) The American National Standard Supplement to Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks, A17.1-1971, ANSI A17.1a-1972 is hereby adopted as additional standards for compliance in this state for elevators, dumbwaiters, escalators, and moving walks installed from February 25, 1972, through June 30, 1982, and by this reference such standards are incorporated herein as though fully set forth. Copies of this supplement may be obtained from The American Society of Mechanical Engineers, 345 East 47th Street, New York, New York 10017.

(2) The 1981 edition of ANSI A17.1 is supplemented by the ANSI A17.1a - 1982 supplement for elevators, dumbwaiters, escalators, and moving walks installed on or after March 1, 1984, through January 9, 1986. The 1981 edition of ANSI A17.1 and ANSI A17.1a - 1982 is supplemented by ANSI A17.1b - 1983 for elevators, dumbwaiters, escalators, and moving walks installed on or after December 1, 1984, through January 9, 1986, with the exception of portable escalators covered by Part VIII of ANSI A17.1b - 1983.

(3) The 1984 edition of ANSI A17.1 is supplemented by the ANSI A17.1a - 1985 supplement for elevators, dumbwaiters, escalators, and moving walks installed on or after January 10, 1986.

(4) The 1984 edition of ANSI A17.1 is supplemented by ANSI A17.1b - 1985, ANSI A17.1c - 1986, ANSI A17.1d - 1986, and ANSI A17.1e - 1987 for elevators, dumbwaiters, escalators, and moving walks installed on or after December 6, 1987.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100, 88-07-101 (Order 88-02), § 296-81-008, filed 3/23/88. Statutory Authority: RCW 70.87.030, 87-23-007 (Order 87-21), § 296-81-008, filed 11/6/87; 82-12-005 (Order 82-18), § 296-81-008, filed 5/20/82; Order 76-37, § 296-81-008, filed 12/3/76; Order 74-31, § 296-81-008, filed 6/14/74.]

WAC 296-81-009 National Safety Standard for Manlifts adopted. The USA Safety Standard for Manlifts, USAS A90.1-1969, is hereby adopted as the standards for compliance in this state for belt manlifts, and by this reference such standards are incorporated herein as though fully set forth. Copies of these standards may be obtained from the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, New York 10017.

[Order 74-31, § 296-81-009, filed 6/14/74.]

EXISTING INSTALLATIONS

WAC 296-81-200 Adoption of elevator codes. (1) Public hearings were held July 23, 1963 and September 24, 1963

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at Olympia, Washington, in accordance with section 25, chapter 130, Laws of 1919, as amended by RCW 49.16.090, chapter 34.04 RCW to consider safety rules governing construction, alterations, use and maintenance of elevators, belt manlifts and moving walks.

(2) American Standard Safety Code for elevators, dumbwaiters and escalators A17.1 1960 shall apply to all new installations.

(3) American Standard Safety Code rules for moving walks A.S.A. 17.1.13 1962. This shall apply to all installations.

(4) Part X of A.S.A. A17.1 1960 maintenance shall apply to existing installations. This part gives maintenance instructions in regard to lubrication, cleanliness, painting, and refinishing, reshackeling and tagging of hoisting ropes, and the inspection and testing of pressure tanks and piston rods.

(5) These requirements became effective as of November 1, 1963.

National Elevator Code adopted—1967: WAC 296-81-006.

[Section 20 of rules, filed 9/28/64.]

WAC 296-81-240 Valves. A shut-off valve shall be installed in the pit or the machine room, whichever is lower, on all hydraulic elevators. (For new installations.)

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030, 92-24-065, § 296-81-240, filed 12/1/92, effective 1/1/93; Order 73-1, § 296-81-240, filed 4/16/73.]

WAC 296-81-275 Smoke detectors. Phase I recall shall be provided for all elevators with fully automatic open and close power operated doors, and shall be activated from, but not limited to, alarm devices in the elevator equipment room(s) and lobbies or areas adjacent to hoistways. Elevator equipment room smoke detector and alarm devices on designated level may cause all cars to return to the alternate level. Smoke detectors may be installed in any hoistway, and shall be installed in hoistways that are sprinkled. Devices for deactivating recall shall be secure from tampering and shall be accessible to fire, inspection, and elevator service personnel only. Owner-designated patient express and emergency hospital service elevators may have a manual control in the car for use by authorized patient care personnel. When activated, it shall preclude Phase I recall.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030, 92-24-065, § 296-81-275, filed 12/1/92, effective 1/1/93. Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100, 88-19-053 (Order 88-18), § 296-81-275, filed 9/15/88.]

WAC 296-81-277 Method to achieve ANSI A17.1-102.2 (c)4. ANSI A17.1-102.2 (c)4 regarding automatic sprinklers in hoistways and machine rooms states:

"Means shall be provided to automatically disconnect the mainline power supply to the affected elevator prior to the application of water."

Rule 102.2 (c)4 shall be accomplished in the following manner:

(1) Fixed temperature heat detector(s) (one hundred thirty-five degrees Fahrenheit) shall be provided at the top of the elevator hoistway and within the elevator equipment

room to disconnect the mainline power of the elevator prior to the application of water from the sprinkler.

(2) Heat detectors shall be ceiling mounted and located within eighteen inches of each sprinkler head. Heat detectors shall be an auxiliary function of the elevator equipment only and shall be identified "elevator control only - DO NOT TEST."

(3) Power for the automatic disconnect control circuit shall be derived from the load side of the elevator power main disconnecting means. The disconnect control device shall be located in the elevator equipment room and shall be easily identifiable.

(4) Automatic sprinkler heads installed in elevator pits do not require a power disconnect device but shall be installed in such a way that the water spray pattern shall not spray higher than three feet above the pit floor with a spray pattern directed level and down. A shut-off valve shall be provided in an accessible location with the handle not more than six feet above the floor.

Alternate methods to achieve ANSI A17.1-102.2 (c)4 must receive approval from the Washington state department of labor and industries elevator section prior to installation.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-81-277, filed 12/1/92, effective 1/1/93. Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 88-24-022 (Order 88-27), § 296-81-277, filed 12/2/88.]

WAC 296-81-280 Electric conduit pipes and ducts.

Electric conduit, pipes, and ducts may be installed in the upper space of the elevator machine room as long as they are installed above the required seven-foot clearance and they do not interfere with the elevator equipment which also must be installed to allow a seven-foot head clearance.

(1) Straight through runs of electrical conduit without junction boxes may be installed in this space.

(2) Pipes and ducts conveying gases, vapor, or liquids may be installed in the space above the machine room provided they are encased in a noncombustible secondary pipe without joints, or a moisture barrier without penetration.

(3) This rule shall apply to all conveyances with installation permits issued by the department of labor and industries after the effective date of these rules.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-81-280, filed 12/1/92, effective 1/1/93.]

WAC 296-81-290 Underground hydraulic elevator pipes, fittings, and cylinders. All newly installed underground pressure cylinders and pipes containing hydraulic elevator fluids shall be encased in an outer plastic containment.

(1) The plastic casing shall be constructed of polyethylene or polyvinyl chloride (PVC). The plastic pipe wall thickness must not be less than .125 inches (3.175 mm). The casing shall be capped at the bottom and all joints must be solvent or heat welded.

(2) The casing shall be sealed and dry around hydraulic pipe and cylinder to contain any leakage into the ground and to prevent electrolysis to hydraulic pipe and cylinder. Dry sand may be used to stabilize the hydraulic cylinder.

(3) A one-half inch pipe nipple with a one-way check valve shall be located between the casing and cylinder for monitoring purposes.

(1999 Ed.)

(4) Alternate methods must receive approval from the Washington state department of labor and industries elevator section prior to installation.

(5) This rule shall apply to all conveyances with installation permits issued by the department of labor and industries on or after the effective date of these rules.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-81-290, filed 12/1/92, effective 1/1/93.]

WAC 296-81-300 Operation and leveling. The elevator shall be automatic and be provided with a self-leveling feature that will automatically bring the car to the floor landings within a tolerance of plus or minus 1/2 inch under normal loading and unloading conditions. This self-leveling shall within its zone, be entirely automatic and independent of the operating device and shall correct for overtravel or undertravel. The car shall also be maintained approximately level with the landing irrespective of load.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-300, filed 12/10/80.]

WAC 296-81-306 Door protective and reopening device. Doors closed by automatic means shall be provided with a door reopening device which will function to stop and reopen a car door and adjacent hoistway door in case the car door is obstructed while closing. This reopening device shall also be capable of sensing an object or person in the path of a closing door without requiring contact for activation at a nominal 5 and 29 inches above the floor.

[Statutory Authority: Chapter 70.87 RCW. 95-04-005, § 296-81-306, filed 1/18/95, effective 3/1/95.]

WAC 296-81-310 Door delay. (1) HALL CALL. The minimum acceptable initial transfer time from notification that a car is answering a call (lantern and audible signal) until the doors of the car start to close shall be 0 to 5 ft. - 4 sec., 10 ft. - 7 sec., 15 ft., - 10 sec., 20 ft. - 13 sec. The distance shall be established from a point in the center of the corridor or lobby (maximum 5 feet) directly opposite the farthest hall button controlling that car to the centerline of the hoistway entrance.

(2) CAR CALL. The minimum acceptable initial transfer time for doors to remain fully open shall be not less than 3 seconds.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-310, filed 12/10/80.]

WAC 296-81-315 Car interior. The car interior shall provide space for wheelchair users to enter the car, maneuver within reach of controls and exit the car.

(1) Doors shall provide (36) inches clear minimum width.

(2) Cab depth (51) inches minimum from rear wall to return panel, with (54) inches minimum from rear wall to inside face of cab door.

(3) Cab width of cab for side opening door (68) inches minimum, center opening door cab width (80) inches minimum.

Clearance between car platform sill and edge of hoistway landing sill shall be (1 1/4) inches maximum.

EXCEPTION. Elevators provided in existing schools, institutions, or other buildings specifically authorized by local authorities may have a minimum clear distance between walls or between wall and door including return panels of not less than 54 x 54 inches. Minimum distance from wall to return panel shall be not less than 51 inches.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-81-315, filed 12/1/92, effective 1/1/93. Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-315, filed 12/10/80.]

WAC 296-81-320 Car controls. At least one set of controls shall be readily accessible from a wheelchair upon entering an elevator.

The centerline of the alarm button and emergency stop switch shall be at nominal (35) inches and the highest floor buttons no higher than (54) inches from the floor where side approach is provided, (48) inches maximum where forward approach is required. Floor registration buttons, exclusive of border, shall be a minimum of (3/4) inch in size, raised or flush. Visual indication shall be provided to show each call registered and extinguished when call is answered. Depth of flush buttons when operated shall not exceed (3/8) inch.

Markings shall be adjacent to the controls on a contrasting color background to the left of the controls. Letters or numbers shall be a minimum of (5/8) inch high and raised (.030) inch. All control buttons shall be designated by Braille. Applied plates permanently attached shall be acceptable. Emergency controls shall be grouped together at the bottom of the control panel. Symbols as indicated shall be used to assist in readily identifying essential controls (see ANSI A17.1, page 114, Rule 211.1). Controls not essential to the operation of the elevator may be located as convenient.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-81-320, filed 12/1/92, effective 1/1/93. Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-320, filed 12/10/80.]

WAC 296-81-325 Car position indicator signal. A visual car position indicator shall be provided above the car control panel or above the door.

(1) As the car passes or stops at a floor, the corresponding numbers shall illuminate and an audible signal shall sound.

(2) Numerals shall be a minimum (1/2) inch high.

(3) Audible signal shall be no less than (20) decibels with frequency no higher than 1500 Hz.

(4) An automatic verbal announcement of the floor number may be substituted for the audible signal.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-81-325, filed 12/1/92, effective 1/1/93. Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-325, filed 12/10/80.]

WAC 296-81-330 Telephone or intercommunicating system. An emergency two-way communication system shall be provided between the elevator and a point outside the hoistway that shall comply with ASME/ANSI A17.1-1990, and the following:

(1) Highest operable part of system shall be a maximum (48) inches from the floor.

(2) System shall be identified by raised symbol and lettering located adjacent to the device. Characters shall be (5/8) inch to (2) inches high, raised (1/32) inch, upper case, sans

serif or simple serif type, and shall be accompanied by Grade 2 Braille.

(3) If system uses a handset, minimum cord length shall be (29) inches.

(4) If located in a closed compartment, door shall be operable with one hand, shall not require tight grasping, pinching, or twisting of the wrist, and shall require a maximum force of (5) lbf.

(5) The emergency communication system shall not require voice communication. (Voice only system is inaccessible to persons with speech or hearing impairments.)

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-81-330, filed 12/1/92, effective 1/1/93. Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-330, filed 12/10/80.]

WAC 296-81-335 Floor covering. Floor covering should have a nonslip hard surface which permits easy movement of wheelchairs. If carpeting is used, it should be securely attached, heavy duty, with a tight weave and low pile, installed without padding.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-335, filed 12/10/80.]

WAC 296-81-340 Handrails. A handrail shall be provided on all walls of the car that are not used for normal exits. There shall be a space of one and one-half inches between the wall and the rail. The rail shall be at a nominal height of between thirty-two to thirty-five inches from the floor. The hand grip portion of handrails shall be not less than one and one-quarter inches or more than two inches in width, shall be basically oval or round in cross-section, and shall have smooth surfaces with no sharp corners. Handrails that approach each other or a blank car wall in the interior corners of the car need not be returned to the wall. If the end of the handrail presents an abrupt end on the closing jamb wall to persons entering a car that has a single-slide or two-speed entrance, the handrail end shall be returned to the wall.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-81-340, filed 12/1/92, effective 1/1/93. Statutory Authority: RCW 70.87.185 and 70.87.034. 84-05-005 (Order 83-37), § 296-81-340, filed 2/6/84. Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-340, filed 12/10/80.]

WAC 296-81-345 Minimum illumination. The minimum illumination shall be in accordance with the latest edition of ANSI A17.1.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-345, filed 12/10/80.]

WAC 296-81-350 Door jamb marking. The floor designation shall be provided at each hoistway entrance on both sides of jamb visible from within the car and the elevator lobby at a centerline height of (60) inches above the floor. Designations shall be on contrasting color background (2) inches high and raised (.03) inch, and shall be accompanied by Grade 2 Braille. Applied plates permanently attached shall be acceptable.

[Statutory Authority: Chapter 70.87 RCW. 95-04-005, § 296-81-350, filed 1/18/95, effective 3/1/95. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-81-350, filed 12/1/92, effective 1/1/93. Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-350, filed 12/10/80.]

WAC 296-81-355 Hall buttons. The centerline of the hall call buttons shall be a nominal (42) inches above the floor. The button designating the UP direction shall be on top.

Direction buttons, exclusive of border, shall be a minimum of (3/4) inch in size, raised, or flush. Visual indication shall be provided to show each call registered and extinguished when the call is answered. Depth of flush buttons when operated shall not exceed (3/8) inch.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-355, filed 12/10/80.]

WAC 296-81-360 Hall lantern. A visual and audible signal shall be provided at each hoistway entrance, indicating to the prospective passenger which car is answering the call and its direction of travel.

The visual signal for each direction shall be at least two and one-half inches in size and visible from the vicinity of the hall call button. The audible signal shall sound once for the up direction and twice for the down direction.

The centerline of the fixture shall be located at least six feet from the floor.

The lanterns may be located in the jamb or in the car.

[Statutory Authority: RCW 70.87.185 and 70.87.034. 84-05-005 (Order 83-37), § 296-81-360, filed 2/6/84. Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-360, filed 12/10/80.]

WAC 296-81-365 Emergency use. Elevators shall comply with ANSI Standard A17.1, Rule 211.3a.

[Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-365, filed 12/10/80.]

WAC 296-81-370 Effective date. The preceding WAC rules, 296-81-300 through 296-81-365, shall apply to all new passenger elevator installations made after the adoption of these rules.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-81-370, filed 12/1/92, effective 1/1/93. Statutory Authority: RCW 70.87.030. 81-01-034 (Order 80-26), § 296-81-370, filed 12/10/80.]

WAC 296-81-990 Advisory board. (1) There is created an advisory board on conveyances. The board shall be composed of five persons appointed by the director of labor and industries or his or her designee with the advice of the chief of the elevator section. The first board members shall serve the following terms:

- (a) One member shall serve for one year;
- (b) One member shall serve for two years;
- (c) One member shall serve for three years; and
- (d) Two members shall serve for four years.

After the first terms, all members shall serve for four years.

(2) The board shall meet on the third Tuesday of February, May, August, and November of each year, and at other times at the discretion of the chief of the elevator section. The board members shall serve without per diem or travel expenses.

(3) The purposes of the board are to advise the department on adoption of codes and rules that apply to conveyances; methods for enforcing and administering the elevator law, chapter 70.87 RCW; and matters of concern to the industry and to owners and users of conveyances.

(1999 Ed.)

(4) The chief of the elevator section shall act as secretary for the board.

[Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-81-990, filed 5/20/82.]

WAC 296-81-991 Civil penalties. (1) An owner or operator of a conveyance that violates a provision of chapter 70.87 RCW, or of the rules adopted under that chapter, is liable for a civil penalty based on the following schedule.

- (a) Operation of a conveyance without a permit:

First violation	\$150.00
Second violation	\$300.00
Each additional violation	\$500.00
- (b) Installation of a conveyance without a permit:

First violation	\$150.00
Second violation	\$300.00
Each additional violation	\$500.00
- (c) Relocation of a conveyance without a permit:

First violation	\$150.00
Second violation	\$300.00
Each additional violation	\$500.00
- (d) Alteration of a conveyance without a permit:

First violation	\$150.00
Second violation	\$300.00
Each additional violation	\$500.00
- (e) Operation of a conveyance for which the department has issued a red tag or has revoked or suspended an operating permit: \$500.00
- (f) Failure to comply with a correction notice:

Within 90 days	\$100.00
Within 91-180 days	\$250.00
Within 181-270 days	\$400.00
Within 271-360 days	\$500.00

(2) A violation will be a "second" or "additional" violation only if it occurs within one year of the first violation.

(3) The department shall by certified mail notify a person of its determination that the person has violated this section.

(4) A person aggrieved by a notice of the department under this section may request a hearing to contest the department's determination that a violation has occurred or to contest the penalty. The request for hearing must be in writing, and must be accompanied by a certified or cashier's check for two hundred dollars payable to the department. The request for hearing must be postmarked, or must be received by the department, within fifteen days after the person receives the order of the department.

[Statutory Authority: RCW 70.87.030 and 70.87.185. 84-23-001 (Order 84-21), § 296-81-991, filed 11/8/84. Statutory Authority: RCW 70.87.185 and 70.87.034. 84-05-005 (Order 83-37), § 296-81-991, filed 2/6/84.]

Chapter 296-82 WAC

SAFETY STANDARDS FOR EXISTING BELT
MANLIFTS

WAC

296-82-010	Belt manlifts—Definitions.
296-82-016	General requirements—Landings.
296-82-019	General requirements—Floor opening guards.
296-82-022	General requirements—Protection of entrances and exits.
296-82-025	General requirements—Guards for openings.
296-82-028	General requirements—Guards at floor landings.
296-82-031	General requirements—Bottom arrangement.
296-82-034	General requirements—Top clearance.
296-82-037	General requirements—Emergency exit ladders.
296-82-040	General requirements—Illumination.
296-82-045	Belt manlifts mechanical requirements—Machines.
296-82-048	Belt manlifts mechanical requirements—Speed.
296-82-051	Belt manlifts mechanical requirements—Platforms or steps.
296-82-054	Belt manlifts mechanical requirements—Handholds.
296-82-057	Belt manlifts mechanical requirements—Up limit stops.
296-82-060	Belt manlifts mechanical requirements—Emergency stop.
296-82-066	Belt manlifts mechanical requirements—Instruction and warning signs.
296-82-070	Operating rules—Carrying of materials and tools.
296-82-078	Tests and inspections—Periodic inspection.

DISPOSITION OF SECTIONS FORMERLY
CODIFIED IN THIS CHAPTER

296-82-013	General requirements—Floor openings. [Rule 1.010, effective 12/1/62.] Repealed by Order 74-31, filed 6/14/74.
296-82-063	Belt manlifts mechanical requirements—Factors of safety. [Rule 2.070, effective 12/1/62.] Repealed by Order 74-31, filed 6/14/74.
296-82-075	Tests and inspection—Acceptance tests. [Rule 4.010, effective 12/1/62.] Repealed by Order 74-31, filed 6/14/74.

WAC 296-82-010 Belt manlifts—Definitions. (1) **Factor safety.** The factor of safety is the ratio of the ultimate strength of the material to the allowable stress when a part is subjected to full load operation.

(2) **Handhold (handgrip).** A handhold is a device attached to the belt to assist a passenger in maintaining balance.

(3) **Open type.** One which has a handgrip surface fully exposed.

(4) **Closed type.** A cup-shaped device in which the handgrip surface is available only in the direction of travel and is covered on the opposite run.

(5) **Limit switch.** A device the purpose of which is to cut off the power to the motor and apply the brake to stop the carrier in the event that a loaded step passes the top terminal landing.

(6) **Manlift.** A manlift is a device consisting of a power-driven endless belt provided with steps or platforms and handholds attached to it for the transportation of personnel from floor to floor.

(7) **Rated speed.** Rated speed is the speed for which the device is designed and installed.

(8) **Step (platform).** A step is a passenger carrying unit.

[Rules (part), effective 12/1/62.]

WAC 296-82-016 General requirements—Landings.

(1) **Vertical clearance.** The clearance between the floor or mounting platform and the lower edge of the conical guard

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above it required by WAC 296-82-019 shall be not less than seven feet, six inches. Where this clearance cannot be obtained no access to the manlift shall be provided and the manlift runway shall be enclosed where it passes through such floor.

(2) **Clear landing space.** The floor space adjacent to the floor openings shall be free from obstructions and kept clear at all times.

(3) **Lighting of landings.** Adequate lighting, not less than three foot-candles, shall be provided at each floor landing at all times when the lift is in operation.

(4) **Landing surface.** The landing surfaces at the entrances and exits to the manlift shall be so constructed and maintained as to provide safe footing at all times.

(Coefficient of friction of not less than 0.5.)

(5) Emergency landings.

(a) Emergency landings shall be provided so that anyone who is required to transfer from the belt manlift to the emergency ladder will not be required to travel on an emergency ladder a distance greater than twenty-five feet to a floor landing or an emergency landing.

(b) Such emergency landings shall be accessible from both runs of the manlift and shall give access to the ladder required in WAC 296-82-037.

(c) Emergency platforms shall be completely enclosed with a standard railing and toeboard.

[Rule 1.020, effective 12/1/62.]

WAC 296-82-019 General requirements—Floor opening guards. (1) On the ascending side of the manlift all landings shall be provided with a bevel guard or cone meeting the following requirements:

(a) **Slope.** Where possible, the cone shall make an angle of not less than forty-five degrees with the horizontal. An angle of sixty degrees or greater shall be used where ceiling heights permit.

(b) **Extent.** Where possible, the guard shall extend at least forty-two inches outward from any handhold on the belt. It shall not extend beyond the upper surface of the floor above.

(c) **Material and construction.** The cone shall be made of not less than Number 18 U.S. gauge sheet steel or material of equivalent strength or stiffness. The lower edge shall be rolled to a minimum diameter of one-half inch and the interior shall be smooth with no rivets, bolts or screws protruding.

(2) Obstructions shall be guarded in the same manner as floor openings with the same minimum distances observed.

[Order 74-31, § 296-82-019, filed 6/14/74; Rule 1.030, effective 12/1/62.]

WAC 296-82-022 General requirements—Protection of entrances and exits. (1) **Guardrail requirement.** The entrances and exits at all floors or landings affording access to the manlift shall be guarded by a maze (staggered railing) or a handrail equipped with self closing gates.

(2) **Construction.** The rails shall be standard guardrails with toeboards meeting the requirements of the general safety standards.

(3) **Gates.** Gates, if used, shall open outward and shall be self closing. Corners of gates shall be rounded.

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(4) **Maze.** Maze or staggered openings shall offer no direct passage between enclosure and outer floor space.

(5) Rails shall be located at least two feet but not more than four feet from the edge of the opening measured at right angles to the face of the belt. The intersection of the top rail and the end post at openings shall be a bend or standard long sweep "ell."

(6) Except where building layout prevents, entrances at all landings shall be in the same relative position.

[Rule 1.040, effective 12/1/62.]

WAC 296-82-025 General requirements—Guards for openings. (1) **Construction.** The floor opening at each landing shall be guarded on sides not used for entrances or exit by a standard railing and toeboard or by panels of wire mesh of not less than number 10 U.S. gauge, expanded metal of not less than number 13 U.S. gauge or sheet metal of equivalent strength or metal on a frame of angle iron not less than one and one-quarter by one-eighth inch or of one and one-quarter inch iron pipe.

(2) When belt manlift is installed in a stair well a standard guard rail shall be placed between the floor openings of the manlift and the stairways.

(3) **Height and location.** Such rails or guards shall be at least forty two inches in height on the up-running side and sixty six inches on the down running side. If a guardrail is used the section of the guard above the rail may be of the construction specified in subsection (1) above or may consist of vertical or horizontal bars which will reject a ball six inches in diameter. Rails or guards shall be located not more than one foot from the edge of the floor opening.

[Rule 1.050, effective 12/1/62.]

WAC 296-82-028 General requirements—Guards at floor landings. Expanded metal, sheet metal or wood guards must be installed to cover the area from the floor to seven feet above the floor on each exposed side of the belt manlift at each floor landing, so persons can not place their hands in the area where the step rollers travel.

[Rule 1.060, effective 12/1/62.]

WAC 296-82-031 General requirements—Bottom arrangement. (1) **Bottom landing.** (Where possible.) At the bottom landing the clear area shall be not smaller than the area enclosed by the guardrails on the floors above, and any wall in front of the "down" running side of the belt shall be not less than forty-eight inches from the face of the belt. This space shall not be encroached upon by stairs or ladders.

(2) **Location of lower pulley.** The lower (boot) pulley shall be installed so that it is supported by the lowest landing served.

(3) **Mounting platform.**

(a) A mounting platform shall be provided in front or to one side of the up-run at the lowest landing, unless the floor level is such that the following requirement can be met: The floor or platform shall be at or above the point at which the upper surface of the ascending step assumes a horizontal position.

(b) A platform shall be provided in front or to one side of the down-run at the lowest landing unless the floor level is

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such that the following requirements can be met: The floor or platform shall be at or above the point at which the upper surface of the descending step leaves the horizontal position.

[Order 74-31, § 296-82-031, filed 6/14/74; Rule 1.070, effective 12/1/62.]

WAC 296-82-034 General requirements—Top clearance. Top emergency landing. (Where possible.) Where the center of the head pulley is greater than six feet above the top landing, an emergency landing and ladder must be installed. The landing shall be twenty-four inches below the center of the head pulley.

[Order 74-31, § 296-82-034, filed 6/14/74; Rule 1.080, effective 12/1/62.]

WAC 296-82-037 General requirements—Emergency exit ladders. (1) **Where required.** A fixed metal ladder accessible from both the "up" and "down" run of the manlift shall be provided where the vertical distance between landings exceeds twenty feet.

(2) **Construction.** Such ladder shall be in accordance with the existing general safety standards for ladders except that enclosing cages shall not be provided.

[Rule 1.090, effective 12/1/62.]

WAC 296-82-040 General requirements—Illumination. (1) **General.** Both runs of the manlift shall be illuminated at all times when the lift is in operation. An intensity of not less than one foot-candle shall be maintained at all points.

(2) **Control of illumination.** Lighting of manlift runways shall be by means of circuits permanently tied in to the building circuits (no switches), or shall be arranged to be turned on by the starting switch controlling the manlift motor, or shall be controlled by switches at each landing. Where separate switches are provided at each landing, any switch shall turn on all lights necessary to illuminate the entire runway.

[Rule 1.100, effective 12/1/62.]

WAC 296-82-045 Belt manlifts mechanical requirements—Machines. (1) **Types.** Machines shall be of the direct connected type or shall be driven by multiple V-belts. Cast-iron gears shall not be used.

(2) **Brake.** A mechanically applied, electrically released brake shall be applied to the motor shaft for direct connected units or to the in-put shaft for belt driven units. The brake shall be capable of stopping and holding the manlift with its rated capacity.

(3) **Belt fastenings.** Belts shall be fastened by a lapped splice or shall be butt spliced with a strap on the side of the belt away from the pulley. For lapped splices, the overlap of the belt at the splice shall be not less than three feet where the total travel of the manlift does not exceed one hundred feet and not less than four feet, if the travel exceeds one hundred feet.

Where butt splices are used the straps shall extend not less than three feet on one side of the butt for a travel not in excess of one hundred feet, and four feet for a travel in excess of one hundred feet.

For twelve inch belts, the joint shall be fastened with not less than twenty special elevator bolts, each of a minimum diameter of one-quarter inch. These bolts shall be arranged symmetrically in five rows so arranged as to cover the area of

[Title 296 WAC—p. 1877]

the joint effectively. The minimum number of bolts for a belt width of fourteen inches shall be not less than twenty-three and for belt widths of sixteen inches, the number of bolts shall be not less than twenty-seven.

(4) Overspeed protection. The machine shall be so designed and constructed to hold the driving pulley in event of shaft failure or overspeed. This applies to new and existing installations.

[Order 74-31, § 296-82-045, filed 6/14/74; Rule 2.010, effective 12/1/62.]

WAC 296-82-048 Belt manlifts mechanical requirements—Speed. All manlifts in a given plant should run at approximately the same speed.

[Order 74-31, § 296-82-048, filed 6/14/74; Rule 2.020, effective 12/1/62.]

WAC 296-82-051 Belt manlifts mechanical requirements—Platforms or steps. (1) Minimum depth. Steps or platforms shall be not less than twelve inches nor more than fourteen inches deep, measured from the belt to the edge of the step or platform.

(2) Width. The width of the step or platform shall be not less than the width of the belt to which it is attached.

(3) Distance between steps. The distance between steps shall be equally spaced and not less than sixteen feet measured from the upper surface of one step to the upper surface of the next step above it.

(4) Angle of step. The surface of the step shall make approximately a right angle with the "up" and "down" run of the belt, and shall travel in an approximately horizontal position with the "up" and "down" run of the belt.

(5) Surfaces. The upper or working surfaces of the step shall be of a material having inherent nonslip characteristics (coefficient of friction not less than 0.5) or shall be covered completely by a nonslip tread securely fastened to it.

(6) Strength of step supports. Step frames or supports and their guides shall be adequate strength to:

(a) Prevent the disengagement of any step roller.

(b) Prevent any appreciable misalignment.

(c) Prevent any visible deformation of the step or its support.

(7) Prohibition of steps without handholds. No step shall be provided unless there is a corresponding handhold above or below it meeting the requirements of WAC 296-82-054. If a step is removed for repairs or permanently, the handholds immediately above and below it shall be removed before the lift is again placed in service.

[Order 74-31, § 296-82-051, filed 6/14/74; Rule 2.030, effective 12/1/62.]

WAC 296-82-054 Belt manlifts mechanical requirements—Handholds. (1) Location. Handholds attached to the belt shall be provided and so installed that they are not less than four feet nor more than four feet eight inches above the step tread. These shall be so located as to be available on both the "up" and "down" run of the belt.

(2) Size. The grab surface of the handhold shall be not less than four and one-half inches in width. Fastenings for handholds shall not come within one inch of the belt edge.

(3) Strength. The handhold shall be capable of withstanding without damage a load of three hundred pounds applied parallel to the run of the belt.

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(4) Prohibition of handhold without steps. No handhold shall be provided without a corresponding step. If a handhold is removed permanently or temporarily, the corresponding step and handhold for the opposite direction of travel shall also be removed before the lift is again placed in service.

[Order 74-31, § 296-82-054, filed 6/14/74; Rule 2.040, effective 12/1/62.]

WAC 296-82-057 Belt manlifts mechanical requirements—Up limit stops. (1) Requirements. Two separate automatic stop devices shall be provided to cut off the power and apply the brake when a loaded step passes the upper terminal landing. One of these shall consist of a switch mechanically operated by the belt or step roller. The second may consist of any of the following:

(a) Roller switch placed above and out of line with the first limit switch.

(b) Photocell and light source ("electric eye").

(c) A switch actuated by a lever, rod, or plate, the latter placed above the head pulley so as to just clear a passing step.

(2) Manual reset location. After the manlift has been stopped by this device it shall be necessary to reset the automatic stop manually. The device shall be so located at the top landing that a person resetting it shall have a clear view of both the "up" and "down" runs of the manlift. It shall not be possible to reset the device from any step or platform.

(3) Cut-off point. The device shall function so that the manlift will be stopped before the loaded step has reached a point twenty-four inches above the top terminal landing.

(4) Electrical requirements.

(a) Where such switches open the main motor circuit directly they shall be of the multiple type.

(b) Where photoelectric devices are used they shall be so designed and installed that the failure of the light source, or of the light sensitive element, or of any other vacuum tubes employed in the circuit will result in shutting off the power to the driving motor.

(c) Where flammable vapors or dusts may be present all electrical installations shall be in accordance with national electrical code requirements for such locations.

(d) Unless of the oil immersed type, controller contacts carrying the main motor current shall be copper to carbon, except where the circuit is broken at two or more points simultaneously.

[Rule 2.050, effective 12/1/62.]

WAC 296-82-060 Belt manlifts mechanical requirements—Emergency stop. (1) Requirement. An emergency stop means shall be provided.

(2) Location. This stop means shall be within easy reach of the ascending and descending runs of the belt.

(3) Operation. This stop means shall be so connected with the control lever or operating mechanism that it will cut off the power and apply the brake when pulled in the direction of travel.

(4) Material. This stop may consist of a cotton rope with a wire center, manila or sisal rope, or may be made up of suitable lengths of metallic pipe or tubing. If rope is used, it shall be not less than three-eighths inch in diameter. Wire rope, unless marlin covered, shall not be used.

(5) Normal stopping use. This emergency stop may be used for normal stopping (and starting) where the manlift does not run continuously.

(6) Emergency stop switch, treadle type on down side. An emergency stop treadle switch shall be placed in the area below the lowest landing on the "down" side. This switch must stop the mechanism if a person should fail to get off at the lowest landing and be ejected from the step as it approaches its position to travel around the boot pulley. The treadle stop switch shall be of the manual reset type.

[Order 74-31, § 296-82-060, filed 6/14/74; Rule 2.060, effective 12/1/62.]

WAC 296-82-066 Belt manlifts mechanical requirements—Instruction and warning signs. (1) **Instruction signs at landings or on belt.** Signs of conspicuous and easily read style giving instructions for the use of the manlift shall be posted at each landing or stenciled on the belt.

(a) Size and legibility. Such signs shall be of letters not less than one inch in height and of a color having high contrast with the surface on which it is stenciled or painted (white or yellow on black or black on white or gray).

(b) Inscription. The instructions shall read approximately as follows:

- "Face the belt"
- "Use the handhold"
- "To stop - pull rope"

(2) Top floor warning sign or light.

(a) Requirement. At the top floor an illuminated sign be displayed bearing the following wording:

"Top floor - get off"

(b) Size of letters. Signs shall be in block letters not less than two inches in height

(c) Location. This sign shall be located within easy view of an ascending passenger and not more than two feet above the top terminal landing.

(d) Alternate warning light. As an alternate for the sign required by (2)(a) above, a red light of not less than forty watt rating may be provided immediately below the upper terminal landing and so located as to shine in a passenger's face will be accepted.

(3) Visitor warning.

(a) Requirement. A conspicuous sign having the following legend - "employees only - visitors keep off" - shall be displayed at each landing.

(b) Size of letters. Sign shall be of block letters not less than two inches in height and shall be of a color offering high contrast with the background color.

(4) Bottom of manlift warning sign or light.

(a) A sign or light warning the passenger he is approaching bottom landing shall be posted above bottom landing in a conspicuous place. Sign or light to be similar in size to top warning light and sign noted above.

(b) An electric buzzer. An electric buzzer shall be installed five feet above the bottom landing on the down side to warn the rider that he is approaching the bottom landing and the buzzer shall be activated automatically by the weight of a load on a step.

[Rule 2.080, effective 12/1/62.]

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WAC 296-82-070 Operating rules—Carrying of materials and tools. (1) No freight or packaged goods shall be carried on any manlift.

(2) No pipe, lumber, or other construction materials shall be handled on any manlift.

(3) No tools except those which will fit entirely within a pocket in usual working clothes shall be carried on any manlift except as provided in subsection (4) below.

(4) Tools may be carried in a canvas bag having dimensions not larger than eleven inches by thirteen inches and provided with carrying loops or handles. Such bag shall be provided with a leather bottom. Such bag shall not be provided with shoulder straps but shall be carried in the passenger's hand while he is riding the manlift.

[Rule 3.010, effective 12/1/62.]

WAC 296-82-078 Tests and inspections—Periodic inspection. (1) **Frequency.** All manlifts shall be inspected by a competent designated person at intervals of not more than thirty days.

(2) **Items covered.** This periodic inspection shall cover but is not limited to the following items:

- Steps
- Step fastenings
- Rails
- Rail supports and fastenings
- Rollers and slides
- Belt and belt tension
- Handholds and fastenings
- Guardrails
- Lubrication
- Warning signs and lights
- Signal equipment
- Drive pulley
- Bottom (boot) and pulley
- Clearance
- Pulley supports
- Motor
- Driving mechanism
- Brake
- Electrical switches

(3) **Inspection log.** A written record shall be kept of findings at each inspection. Records of inspection shall be made available to duly qualified inspectors.

[Rule 4.020, effective 12/1/62.]

Chapter 296-84 WAC HAND POWER MANLIFTS

WAC

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| <ul style="list-style-type: none"> 296-84-010 296-84-015 296-84-020 296-84-025 296-84-030 296-84-035 296-84-040 296-84-045 296-84-050 296-84-055 296-84-060 296-84-065 296-84-070 | <ul style="list-style-type: none"> Scope and application. Waiver and variance. Hoistway landings. Hoistway clearances. Habitable space under hoistways. Hoistway guide rails. Buffer springs and overtravel of car. Car specifications. Counterweights. Sheaves. Hoisting ropes. Operating rope. Lighting. |
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296-84-075 Overhead supports.
296-84-080 General requirements.

WAC 296-84-010 Scope and application. The following requirements shall apply to the installation, design and use of all one man capacity, hand power counterweighted elevators subject to inspection as required by RCW 49.16.120.

[Rules (part), effective 5/15/64.]

WAC 296-84-015 Waiver and variance. The supervisor of safety may, upon receipt of application and after adequate investigation by the department, permit a variation from these requirements when other accepted means of protection are provided. Any variation granted under the provisions of this paragraph shall be limited to the particular case or cases covered in the application for variation and may be revoked for cause. The permit for variance shall be conspicuously posted on the premises prior to becoming effective and shall remain posted during the life of such waiver.

[Rules (part), effective 5/15/64.]

WAC 296-84-020 Hoistway landings. (1) Every hoistway landing shall be protected on sides other than the landing opening side with a standard guard rail and intermediate guard rail. All landings except the bottom landing shall have a toe board installed on all sides except the landing opening side.

(2) All hoistway entrances shall be not less than six feet six inches in height and in no case shall the width exceed the corresponding car dimensions.

(3) All hoistway entrances must be provided with an approved maze or with a hoistway gate which shall:

(a) Be at least thirty-six inches in height.

(b) Extend downward to within one inch of the landing sill.

(c) Be of the self-closing type, designed to swing horizontal out from the hoistway and closing against a full jamb stop.

(d) Be located within four inches of the hoistway edge of the landing sill.

(e) Have a "DANGER" sign conspicuously posted on the landing side of the hoistway gate.

(f) Withstand a two hundred fifty pound horizontal thrust.

(4) For any new installation, all projections extending inwardly from the hoistway enclosure at the entrance side of the car platform shall be bevelled and substantially guarded on the underside by smooth solid material set at an angle of not less than sixty degrees, nor more than seventy-five degrees from the horizontal when cars are not equipped with gates.

[§ I, Rules 1.010-1.040, effective 5/15/64.]

WAC 296-84-025 Hoistway clearances. (1) The minimum clearance between the side of the car and a hoistway enclosure shall be one inch.

(2) The clearance between the car platform and the landing sill shall not be less than one-half inch and not more than one and one-half inches.

[§ II, Rules 2.010-2.020, effective 5/15/64.]

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WAC 296-84-030 Habitable space under hoistways.

There shall be no habitable space below the elevator hoistway or counterweight shaft unless the floor is supported to withstand any impact caused by the car or counterweight dropping freely onto the floor.

[§ III, Rule 3.010, effective 5/15/64.]

WAC 296-84-035 Hoistway guide rails. (1) There shall be a minimum of two opposing guide rails extending to a point six inches beyond the full height of travel of the car when the counterweight buffer is fully compressed.

(2) All rails shall be supported by bolts, lag screws or other approved methods to a vertical supporting member which shall not exceed one-half inch deflection with the application of a two hundred fifty pound horizontal thrust at any point.

(3) Wood guide rails shall be at least one and one-half inch by one and one-half inch vertical grain fir or equivalent and shall not vary more than three-sixteenth inch in thickness on the sides to which the brakes make contact. All joints shall be kept smooth and even.

[§ IV, Rules 4.010-4.030, effective 5/15/64.]

WAC 296-84-040 Buffer springs and overtravel of car. Substantial spring buffers shall be installed below the car and also below the counterweight on all new installations. All installations shall have spring buffers attached below the counterweight. The hoisting rope shall be of such length that the car platform will not be more than eight inches above the top landing when the counterweight buffer spring is fully compressed.

[§ V, Rule 5.010, effective 5/15/64.]

WAC 296-84-045 Car specifications. (1) The car shall be built to the following specifications:

(a) The car platform shall be not greater than thirty inches on either side, (6.25 square feet area).

(b) The car frame and platform shall be of steel or sound seasoned wood construction and be designed with a factor of safety of not less than four for metal and six for wood, based on a maximum capacity of two hundred fifty pounds.

(c) All frame members shall be securely bolted, riveted or welded and braced. If bolted, lock washers or lock nuts must be used.

(d) Where wooden frame members are bolted, large washers or metal plates shall be used to minimize the possibility of splitting or cracking the wood.

(2) The sides of the car shall be enclosed by a minimum of two safety guard rails with the top rail not less than thirty-six inches nor more than forty-two inches from the car floor and with the intermediate bar bisecting the height. Rails shall sustain a horizontal thrust of two hundred fifty pounds. If solid material is used it shall be smooth surfaced and not less than one-half inch thickness, if wood; and not less than sixteen gauge thickness, if steel; and shall be constructed from the car floor to a height of not less than three feet.

(a) Where the hoistway is not enclosed on the entrance side of the car, a self-locking or drop bar positive stop type car gate must be provided. Car gate may be of the folding type, horizontally swung, provided it swings into the car

enclosure. Drop bar gates must be of two bar construction, parallelogram type, and conform to requirements specified for car guard rails.

(b) The car gate shall drop into locking slots or be provided with a positive locking type latch capable of withstanding two hundred fifty pounds horizontal thrust.

(3) Every car shall have a substantial protective top. The front half may be hinged. The protective top may be made from number 9 U.S. wire gauge screen, 11 gauge expanded metal, 14 gauge sheet steel or three-quarter inch or heavier plywood. If made of wire screen or metal, the openings shall reject a one-half inch diameter ball.

(4) Every car shall have a proper rack to hold the balance weights.

(5) A sign bearing the following information shall be conspicuously posted within the car:

- (a) Maximum capacity one person
- (b) Total load limit in pounds
- (c) For authorized personnel use only.

(6) Every car shall be equipped with a spring loaded foot brake which:

- (a) Will operate independently of the car safeties.
- (b) Will operate in both directions and will stop and hold the car and its load.

(c) Will lock the car in its position automatically whenever the operator releases the pressure on the foot pedal.

(7) Every car shall be equipped with a car safety device which will:

- (a) Apply to the sides of the main guide rails.
- (b) Stop and hold the car and its load immediately when the hoisting rope breaks.

(8) Every car shall have a minimum clearance of six feet six inches from the top of the car platform to the bottom edge of the crosshead or any other obstruction.

(9) A tool box with minimum dimensions of four inches wide by sixteen inches long by three inches in depth shall be provided and firmly attached to the car structure.

[§ VI, Rules 6.010-6.090, effective 5/15/64.]

WAC 296-84-050 Counterweights. (1) The assembly of sectional counterweight shall conform to the following requirements:

(a) Rectangular type shall be held together by at least two tie rods one-half inch in diameter fastened with lock washers and double nuts or other approved means.

(b) One three-quarter inch rod may be used to hold the sections of a round counterweight together. Any additional sections or weights shall be secured by an approved means.

(2) The eye bolt for the rope hitch shall be attached to the counterweight in a manner that will prevent the eye bolt from coming loose. The eye of eye bolts shall be welded to prevent them from opening.

(3) Every counterweight runway shall be enclosed with substantial unperforated material for its full distance of travel. Inspection openings shall be provided at either the top or bottom of the counterweight runway. These openings shall be substantially covered at all times except when actually engaged in inspection of counterweight fastenings.

(4) Workmen shall load the counterweight for the proper balance of the heaviest person using the elevator and others

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shall use compensating weights, which shall be available, to maintain a balance suitable for their needs.

(5) On elevators with travel of seventy-five feet or more, a compensating chain or cable shall be installed to maintain the proper balance of the counterweight to the car and load in all positions.

[§ VII, Rules 7.010-7.050, effective 5/15/64.]

WAC 296-84-055 Sheaves. The minimum sheave diameter shall be forty times the diameter of the ropes used, i.e., fifteen inch for three-eighths inch rope.

[§ VIII, Rule 8.010, effective 5/15/64.]

WAC 296-84-060 Hoisting ropes. (1) Hoisting rope shall be of good grade traction elevator wire rope, and shall:

- (a) Be not less than three-eighths inches in diameter.
- (b) Provide a factor of safety of five based on the maximum weight supported.

(c) Be of such length to prevent the counterweight from striking the overhead structure when car is at bottom landing, and prevent the car from striking the overhead before the counterweight is at its lower limit of travel.

(d) Be fastened at each end by at least three or more clamps, the "U" of the clamp bearing on the dead end of the rope.

(e) Where passed around a metal or other object less than three times the diameter of the cable, have a thimble of the correct size inserted in the eye.

(2) Approved sockets or fittings with the wire properly turned back and babbitted may be used in place of clamps noted in subsection (1)(d) above.

[§ IX, Rules 9.010-9.020, effective 5/15/64.]

WAC 296-84-065 Operating rope. The operating rope shall be of soft hemp or cotton at least three-quarter inch in diameter, and be securely fastened at each end and shall be in proper vertical alignment to prevent bending or cutting where it passes through the openings in the platform or the protective top of the car.

[§ X, Rule 10.010, effective 5/15/64.]

WAC 296-84-070 Lighting. Adequate lighting shall be provided at each landing and in the shaftway.

[§ XI, Rule 11.010, effective 5/15/64.]

WAC 296-84-075 Overhead supports. The overhead supporting members shall be designed, based upon impact loads, with a factor of safety of:

- (1) Nine if wood;
- (2) Five if steel.

[§ XII, Rule 12.010, effective 5/15/64.]

WAC 296-84-080 General requirements. (1) No person other than an employee or duly authorized person shall ride or be permitted to ride in the car.

(2) Escape ladders shall be installed to extend the full length of the hoistway and shall be located in a position whereby, in an emergency, a person can safely transfer from the car platform to the ladder. "IMPAIRED CLEARANCE" sign

[Title 296 WAC—p. 1881]

to be posted at bottom of ladders when face of ladder is less than thirty inches from any structure.

(3) An automatic safety dog or device shall be installed at the bottom landing which will prevent the car from leaving the landing until manually released by the operator.

(4) A fire extinguisher in proper working condition shall be attached to the car structure.

[§ XIII, Rules 13.010-13.040, effective 5/15/64.]

Chapter 296-85 WAC

MECHANIZED PARKING GARAGE EQUIPMENT

WAC

296-85-005 National code adopted.

WAC 296-85-005 National code adopted. USASI Standard A113.1-1964 "Safety Code for Mechanized Parking Garage Equipment."

[Filed 12/29/67, effective 2/1/68.]

Reviser's note: A part of Order 70-11, filed 9/18/70, effective date 10/21/70, states that the administration of WAC 296-85-005, Safety Code for Mechanized Parking Garage Equipment, shall be under the jurisdiction of the division of building and construction safety inspection services of the department of labor and industries.

Reviser's note: The A.S.A. publications are published by the American Society of Mechanical Engineers, United Engineering Center, 345, East 47th Street, New York, New York 10017.

Chapter 296-86A WAC

REGULATIONS AND FEES FOR ALL ELEVATORS, DUMBWAITERS, ESCALATORS AND OTHER LIFTING DEVICES

(Formerly chapter 296-86 WAC)

WAC

296-86A-010	Do I need a permit to construct, alter or relocate a conveyance?
296-86A-020	When I apply for my construction, alteration or relocation permit, what permit fees will I have to pay?
296-86A-025	When I apply for my material lift installation, alteration or relocation permit, what permit fees will I have to pay?
296-86A-028	Are the construction and alteration permit fees that I pay refundable?
296-86A-030	What installation permit fees will I have to pay for personnel and material hoists?
296-86A-040	Do I need to submit my plans for new installations and alterations to the department for approval?
296-86A-060	What annual operating permit fees will I have to pay?
296-86A-065	Can I replace annual operating permits that have been damaged, lost or stolen?
296-86A-070	Can I obtain a supplemental inspection from the department?
296-86A-073	Can I obtain technical services from the department's elevator section?
296-86A-074	Can I request an inspection outside of the department's normal work hours?
296-86A-075	Do I pay a fee when my conveyance is inspected?
296-86A-080	Is there a fee for inspecting regular elevators used as temporary personnel elevators?

WAC 296-86A-010 Do I need a permit to construct, alter or relocate a conveyance? (1) You must obtain a permit from the department **before** you begin constructing, altering or relocating any conveyance. To obtain your permit, you need to complete the department's permit application and pay a fee. (Consult the appropriate fee schedules in this chapter.)

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Once your application is approved **and** your fee is paid, your permit will be issued and work on your project can begin.

(2) Your construction and alteration permits are valid for one year from the date of issue. However, construction and alteration permits can be renewed if you:

(a) Apply for a renewal permit **before** your current permit expires; and

(b) The department approves your request for a renewal permit; and

(c) You pay a one-dollar renewal fee to the department for each permit you renew.

(3) You **are not required** to obtain permits and pay fees for the following:

(a) Repairs and replacement normally necessary for maintenance and made with parts of equivalent materials, strength and design.

(b) Any conveyance exempted by RCW 70.87.200.

[Statutory Authority: Chapter 70.87 RCW. 98-12-043, § 296-86A-010, filed 5/29/98, effective 6/30/98.]

WAC 296-86A-020 When I apply for my construction, alteration or relocation permit, what permit fees will I have to pay? The following permit fees apply to all conveyances **except for material lifts**:

TOTAL COST	FEE
\$250.00 TO AND INCLUDING \$1,000	\$ 29.50
\$1,001 TO AND INCLUDING \$15,000	
For the first \$1,001	41.50
For each additional \$1,000 or fraction thereof	8.25
\$15,001 TO AND INCLUDING \$100,000	
For first \$15,001	158.75
For each additional \$1,000 or fraction thereof	5.50
OVER \$100,001	
For first \$100,001	666.75
For each additional \$1,000 or fraction thereof	4.50

[Statutory Authority: Chapter 70.87 RCW. 98-12-043, § 296-86A-020, filed 5/29/98, effective 6/30/98.]

WAC 296-86A-025 When I apply for my material lift installation, alteration or relocation permit, what permit fees will I have to pay? The following permit fees apply to the installation, alteration and relocation of material lifts:

TOTAL COST	FEE
\$250.00 TO AND INCLUDING \$1,000	\$ 27.00
\$1,001 TO AND INCLUDING \$15,000	
For the first \$1,001	37.75
For each additional \$1,000 or fraction thereof	7.50
\$15,001 TO AND INCLUDING \$100,000	
For first \$15,001	144.25
For each additional \$1,000 or fraction thereof	5.00
OVER \$100,001	
For first \$100,001	606.25
For each additional \$1,000 or fraction thereof	4.00

(1999 Ed.)

[Statutory Authority: Chapter 70.87 RCW. 98-12-043, § 296-86A-025, filed 5/29/98, effective 6/30/98.]

WAC 296-86A-028 Are the construction and alteration permit fees that I pay refundable? Your construction and alteration permit fees are refundable **unless your permits have expired. If your permits have expired, no refunds for these permits will be issued to you.** All requests for refunds must be addressed to the elevator section in writing and must identify the specific permits for which refunds are being requested. In those cases where you are entitled to a refund, the department will charge you a twenty-five-dollar processing fee for each refund you request.

[Statutory Authority: Chapter 70.87 RCW. 98-12-043, § 296-86A-028, filed 5/29/98, effective 6/30/98.]

WAC 296-86A-030 What installation permit fees will I have to pay for personnel and material hoists? For each personnel hoist or material hoist you install, you will have to pay an installation fee of ninety-seven dollars and seventy-five cents.

[Statutory Authority: Chapter 70.87 RCW. 98-12-043, § 296-86A-030, filed 5/29/98, effective 6/30/98.]

WAC 296-86A-040 Do I need to submit my plans for new installations and alterations to the department for approval? You must submit all new installation plans and plans for major alterations to the department for approval. Your plans must be submitted, in duplicate, to the elevator section **prior to** the start of construction. To be approved, they must comply with the latest edition of the American Society of Mechanical Engineers (ASME) A17.1, National Electrical Code (NEC) and applicable Washington Administrative Codes (WAC) adopted by the department. In addition, your plans must include all information pertinent to determining whether each installation/alteration complies with all applicable codes. Once approved, a copy of your plan must be kept on your job site until all acceptance tests have been witnessed by the department. **Any alterations to your approved plan must be submitted to the department for approval before a final inspection will be conducted.** The nonrefundable fees for reviewing your plans are:

For each installation/major alteration	\$21.50
If more than two sets of plans are submitted, the fee for reviewing each additional set	21.50

[Statutory Authority: Chapter 70.87 RCW. 98-12-043, § 296-86A-040, filed 5/29/98, effective 6/30/98.]

WAC 296-86A-060 What annual operating permit fees will I have to pay? No annual operating permit will be issued to you until you have paid an appropriate fee to the department. The following is a schedule of those fees.

TYPE OF CONVEYANCE	ANNUAL OPERATING PERMIT FEE
Each hydraulic elevator	\$ 75.75
Each roped-hydraulic elevator	97.75
plus \$7.50 for each hoistway opening in excess of two	7.50

(1999 Ed.)

TYPE OF CONVEYANCE	ANNUAL OPERATING PERMIT FEE
Each cable elevator	97.75
plus \$7.50 for each hoistway opening in excess of two	7.50
Each cable elevator traveling more than 25 feet without an opening-\$10.50 for each 25 foot traveled without openings	10.50
Each limited-use/limited-application elevator	75.75
Each sidewalk freight elevator	75.75
Each hand-powered freight elevator	48.75
Each hand-powered manlift	48.75
Each incline elevator in other than a private residence	97.75
Each belt manlift	75.75
Each boat launching elevator	75.75
Each auto parking elevator	75.75
Each escalator	75.75
Each moving walk	75.75
Each dumbwaiter in other than a private residence	48.75
Each people mover	65.00
Each stair lift in other than a private residence	48.75
Each wheel chair lift in other than a private residence	48.75
Each special purpose elevator	75.75
Each personnel hoist	75.75
Each material hoist	75.75
Each casket lift	75.75
Each material lift	65.00
Each inclined stairway chair lift in private residence	16.00
Each inclined wheel chair lift in a private residence	21.50
Each vertical wheel chair lift in a private residence	27.00
Each inclined elevator at a private residence	75.75
Each dumbwaiter in a private residence	21.50
Each private residence elevator	48.75
Each private residence elevator installed in other than a private residence	75.75

[Statutory Authority: Chapter 70.87 RCW. 98-12-043, § 296-86A-060, filed 5/29/98, effective 6/30/98.]

WAC 296-86A-065 Can I replace annual operating permits that have been damaged, lost or stolen? If you have already paid for a current operating permit under WAC 296-86A-060, you may purchase a replacement permit by paying the department's five-dollar replacement permit fee for each permit being replaced. No replacement permit

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will be issued until this replacement fee has been received by the department.

[Statutory Authority: Chapter 70.87 RCW. 98-12-043, § 296-86A-065, filed 5/29/98, effective 6/30/98.]

WAC 296-86A-070 Can I obtain a supplemental inspection from the department? Any person, firm, corporation or governmental agency can obtain a supplemental inspection from the department by paying a fee of two hundred eighty dollars per day plus the standard per diem and mileage allowance granted to department inspectors.

[Statutory Authority: Chapter 70.87 RCW. 98-12-043, § 296-86A-070, filed 5/29/98, effective 6/30/98.]

WAC 296-86A-073 Can I obtain technical services from the department's elevator section? You can obtain elevator field technical services from the department by paying a fee of fifty-four dollars per hour plus the standard per diem and mileage allowance granted to department inspectors. These field technical services may include code evaluation, code consultation, plan examination, code interpretation and clarification of technical data relating to the application of the department's conveyance rules. **Field technical services do not include inspections.**

[Statutory Authority: Chapter 70.87 RCW. 98-12-043, § 296-86A-073, filed 5/29/98, effective 6/30/98.]

WAC 296-86A-074 Can I request an inspection outside of the department's normal work hours? You may request an inspection outside of normal work hours, which are 7:00 a.m. to 5:00 p.m., if an inspector is available and the inspection is authorized by the department. However, the fee for such an inspection is sixty-eight dollars per hour plus the standard per diem and mileage allowance granted to department inspectors. This fee is in addition to any other fees required for your project.

[Statutory Authority: Chapter 70.87 RCW. 98-12-043, § 296-86A-074, filed 5/29/98, effective 6/30/98.]

WAC 296-86A-075 Do I pay a fee when my conveyance is inspected? Not necessarily, some inspections do not require a fee. For example, the initial annual inspection of a conveyance does not require one. Neither does the **initial inspection** of any conveyance constructed, altered or relocated. The following table explains which inspections do require a fee:

INSPECTION	FEE
If a conveyance does not pass an initial inspection and a second inspection (reinspection) is required, the fee for each conveyance inspected*	\$75.75
If a third inspection (reinspection) is required, the fee for each conveyance inspected*	97.75
*These "reinspection" fees are in addition to the fees charged under WAC 296-86A-020, 296-86A-025 and 296-86A-030 and must be paid before an annual operating permit will be issued.	

[Title 296 WAC—p. 1884]

INSPECTION

FEE

The department may waive reinspection fees when it is not possible to conduct the inspection and the inability to inspect is not the fault of the party requesting and/or paying for the inspection.

The department may also waive reinspection fees for reasons of justice and equity which prevent their payment.

[Statutory Authority: Chapter 70.87 RCW. 98-12-043, § 296-86A-075, filed 5/29/98, effective 6/30/98.]

WAC 296-86A-080 Is there a fee for inspecting regular elevators used as temporary personnel elevators? Yes, the fee for **inspecting and testing** regular elevators used as temporary personnel elevators is sixty-five dollars. This fee is in addition to any other fees required in this chapter.

This sixty-five dollar fee purchases a thirty-day temporary use permit which may be renewed at the discretion of the department. When this temporary use permit is purchased, a notice declaring that the equipment has not been finally approved must be conspicuously posted on the elevator.

[Statutory Authority: Chapter 70.87 RCW. 98-12-043, § 296-86A-080, filed 5/29/98, effective 6/30/98.]

Chapter 296-87 WAC

SAFETY REQUIREMENTS FOR WORKMEN'S CONSTRUCTION ELEVATORS

WAC

296-87-001	Scope.
296-87-010	Hoistway construction.
296-87-020	Guide rail brackets and building supports.
296-87-030	Hoistway enclosure.
296-87-040	Hoistway doors.
296-87-050	Landing platform.
296-87-060	Car operating and terminal stopping devices and electrical protective devices.
296-87-070	Car safeties.
296-87-080	Ropes, rope connections, data and record.
296-87-090	Car frames and platforms.
296-87-100	Capacity posting.
296-87-110	Platform size.
296-87-120	Maintenance inspection and test periods.
296-87-130	Car and counterweight buffers.

WAC 296-87-001 Scope. This standard applies to the design, construction, installation, operation, inspection, testing, maintenance, alterations, and repair of structures and hoists which are not a permanent part of the buildings, are installed inside or outside buildings during construction, alteration, or demolition, and are used to raise and lower workers and other persons connected with, or related to, the building project. The hoist may also be used for transportation of materials.

This standard shall not apply to the following:

- (1) Temporary elevators installed in the hoistways during the construction of buildings and incorporating a part of the permanent elevator to be installed later.
- (2) Hoists for raising and lowering materials with no provision for carrying personnel.
- (3) Manlifts, counterbalanced or endless-belt type.
- (4) Mine hoists.
- (5) Wire-rope-guided and nonguided hoists.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-033 (Order 86-12), § 296-87-001, filed 1/10/86.]

WAC 296-87-010 Hoistway construction. (1) The hoistway construction forming the supports for the machinery and guide rails shall be designed and installed to support the loads specified. Overhead beams, floors, and their supports shall be designed for not less than the sum of the following loads:

(a) The load resting on the beams and supports which shall include the complete weight of the machine sheaves, controller, governor and any other equipment together with that portion, if any, of the machine room floor supported thereon.

(b) Twice the sum of the tensions in all wire ropes passing over sheaves or drums supported by the beams with rated load in the car.

(2) Foundations, beams and floors for machinery and sheaves not located directly over the hoistway. For machines and sheaves located below or at the sides of the hoistway, the foundation for the machine and sheave beams and their supports shall be designed to withstand the following loads:

(a) The foundation shall support the total weight of the machine, sheaves and other equipment, and the floor, if any.

(b) The sheave beams and the foundation bolts shall withstand twice the vertical component of the tensions in all hoisting ropes passing over sheaves or drums on the foundation or beams, less the weight of the machine or sheaves.

(c) The sheave beams and the foundation bolts shall withstand twice the horizontal component, if any, of the tensions in all hoisting ropes passing over sheaves or drums on the foundation or beams.

(d) The foundation shall withstand twice the overturning moment, if any, developed by the tension in all the hoisting ropes passing over sheaves or drums on the foundation or beams.

[Order 70-11, § 296-87-010, filed 9/18/70, effective 10/21/70.]

WAC 296-87-020 Guide rail brackets and building supports. The building construction forming the supports for the guide rails and guide rail brackets shall be of such a design as to:

(1) Safely withstand the application of the car or counterweight safety when stopping the car and its rated load or the counterweight.

(2) Withstand the forces imposed by the class of loading. Where necessary the building construction shall be reinforced to provide adequate support for the guide rails.

(3) Each elevator tower shall be anchored to the building at not to exceed twenty-five foot vertical intervals, or if guy wires are used, such guys shall be not less than one-half inch wire rope and terminal fastening be tagged PERSONNEL ELEVATOR—DO NOT REMOVE.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-033 (Order 86-12), § 296-87-020, filed 1/10/86; Order 70-11, § 296-87-020, filed 9/18/70, effective 10/21/70.]

WAC 296-87-030 Hoistway enclosure. (1) Hoistways or towers located inside of buildings shall be enclosed to the full height and width on all sides where no entrances occur, and shall be constructed as specified in WAC 296-87-030(3).

(1999 Ed.)

(2) Hoistway or towers located outside or adjacent to buildings shall be enclosed on all four sides at their lowest landing to a height of ten feet, and to a height of ten feet throughout the entire height where entrances occur, and shall be constructed as specified in WAC 296-87-030(3).

(3) Hoistway enclosures shall be constructed of solid or openwork material conforming to the following requirements:

(a) Openwork material shall reject a ball one and one-half inches in diameter.

(b) Metal enclosures shall be made of wire at least No. 16 steel wire gage or of expanded metal at least No. 16 U.S. gage.

(c) Wood enclosures shall be installed without openings.

(d) Hoistway enclosures shall be so supported and braced that when subjected to a pressure of one hundred pounds applied horizontally at any point the deflection shall not exceed one inch.

[Order 70-11, § 296-87-030, filed 9/18/70, effective 10/21/70.]

WAC 296-87-040 Hoistway doors. (1) For hoistways or towers located inside of buildings the hoistway door shall guard the full height and width of the openings, and shall be so constructed as to withstand one hundred pounds applied at right angles to the center of the door without causing the door to break or be permanently deformed. Each hoistway door shall be equipped with an approved combination of electric contact and mechanical lock.

(2) For hoistways or towers located outside of buildings the hoistway door shall be not less than six feet six inches in height and shall protect the full width of the opening and shall be of strength and design conforming to the hoistway construction. Each hoistway door shall be equipped with an approved combination of electric contact and mechanical lock.

(3) An elevator shall not serve any landing that is not provided with a hoistway door.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-033 (Order 86-12), § 296-87-040, filed 1/10/86; Order 70-11, § 296-87-040, filed 9/18/70, effective 10/21/70.]

WAC 296-87-050 Landing platform. The landing platform from all hoistways or towers to the building shall be constructed to provide a safety factor of three based on the capacity of the elevator and shall be provided with adequate handrails.

[Order 70-11, § 296-87-050, filed 9/18/70, effective 10/21/70.]

WAC 296-87-060 Car operating and terminal stopping devices and electrical protective devices. (1) The operation shall be by car switch or constant pressure push button and shall be so arranged that the elevator car can be operated from within the car only. It shall also be equipped with an emergency stop switch located within or adjacent to the car operating panel.

(2) The travel control cable shall be attached from within the hoistway and securely fastened to the car. The control cable can be of the suspended type, retractable type, or coiled in a suitable container at the base of the tower.

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(3) Terminal and final limits switches shall be installed at the upper and lower landings. These may be mounted on the car or in the hoistway operated by cams attached to the car or in the hoistway.

(4) Phase reversal and failure protection. Elevators having polyphase alternating current power supply shall be provided with means to prevent the starting of the elevator motor if,

- (a) The phase rotation is in the wrong direction, or
- (b) There is a failure of any phase.

(5) Main line contactor. A contactor shall be installed in addition to the direction switches which will cut off main line current to the motor and apply the brake when any of the final terminal stopping devices operate.

(6) A fused disconnect switch of adequate size shall be installed and connected into the power supply line to the controller and be accessible at the lower terminal landing.

(7) Where the hoistway is exposed to the weather the electrical control equipment, fixtures and switches shall be weatherproof.

(8) Machinery and control equipment shall be protected from the weather, falling debris and from access by unauthorized persons. Spaces containing elevator driving machine and control equipment shall be provided with adequate lighting.

(9) All electric elevators shall be equipped with effective brakes that are released electrically and applied by springs. The brakes shall be designed to have a capacity sufficient to hold the car at rest with its rated load, and shall be mounted on the main driving shaft of the machine.

(10) The maximum speed allowable shall be three hundred feet per minute.

(11) Internal combustion engines shall not be permitted for direct drive.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-033 (Order 86-12), § 296-87-060, filed 1/10/86; Order 70-11, § 296-87-060, filed 9/18/70, effective 10/21/70.]

WAC 296-87-070 Car safeties. (1) The car of every elevator shall be provided with car safeties. The safety device shall be capable of stopping and sustaining the entire car with its rated load in the event of a free fall or overspeed.

(2) A speed governor shall be installed on all elevators and shall be so designed that it will actuate the car safeties before the car attains a speed of one hundred and forty percent of the rated speed. If a governor rope is used, it shall be not less than three-eighths inch in diameter and shall be of iron or steel material.

(3) There shall be a switch provided on the car actuated by the setting of the safeties that will remove the electric power from the driving machine motor and brake.

[Order 70-11, § 296-87-070, filed 9/18/70, effective 10/21/70.]

WAC 296-87-080 Ropes, rope connections, data and record. (1) Elevator cars shall be of the traction drive type suspended by steel wire ropes or approved rack and gear. If wire ropes are used, only iron (low carbon steel) or steel wire ropes with fibre cores, having the commercial classification of "elevator wire rope," shall be used for the suspension of elevator cars and for the suspension of counterweights.

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(2) The minimum number of hoisting ropes used shall be three.

(3) Hoisting and counterweight wire ropes may be attached to cars and counterweights by means of approved clamps and wire rope thimbles or by approved special fastening devices. Where clamps are used, the fastening shall conform to the following:

- (a) Clamps shall not be of the U-bolt type.
- (b) Both members of the clamps shall be provided with seats conforming to the lay of the rope.
- (c) Clamps shall be drop forgings.
- (d) The ropes to be clamped shall be passed around metal thimbles having not less than the following dimensions and fastened by at least the number of clamps specified with not less than the spacing indicated in the following table.

Dia. of Wire Rope	Inside Width of Thimble	Length of Thimble In.	Min. No. of Clamps	Min. Spacing of Clamps
1/2	1/2	2 3/4	3	3
5/8	1 3/4	3 1/4	3	3 3/4
3/4	2	3 3/4	4	4 1/2
7/8	2 1/4	4 1/4	4	5 1/4
1	2 1/2	4 1/2	4	6

(4) Wire rope shall be taken out of service when any of the following conditions exist:

- (a) In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay;
- (b) Wear of one-third the original diameter of outside individual wires. Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure;
- (c) Evidence of any heat damage from any cause;
- (d) Reductions from nominal diameter of more than three sixty-fourths inch for diameters to and including three-fourths inch, one sixteenth inch for diameter seven-eighths inch to one and one-eighth inches inclusive, three thirty-seconds inch for diameters one and one-fourth to one and one-half inches inclusive; and
- (e) In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-033 (Order 86-12), § 296-87-080, filed 1/10/86; Order 70-11, § 296-87-080, filed 9/18/70, effective 10/21/70.]

WAC 296-87-090 Car frames and platforms. (1) Every elevator suspended by wire ropes shall have a car frame consisting of a crosshead, uprights (stiles) and a plank located approximately at the middle of the car platform. Car frames suspended by wire ropes or cantilevered rack and gear shall be guided on each guide rail by upper and lower guiding members attached to the frame. The frame and its guiding member shall be designed to withstand the forces resulting under the loading conditions for which the elevator is designed.

(2) Every elevator car shall have a platform consisting of a nonperforated floor attached to a platform frame supported by the car frame and extending over the entire area within the car enclosure. The platform frame members and the floor shall be designed to withstand the forces developed under the

loading conditions for which the elevator is designed and installed.

(3) Materials used in the construction of car frames and platforms shall be made of steel. The platform stringers shall be made of steel or of wood.

(4) The car shall be completely enclosed with metal except where entrances occur. The car shall have a top sufficiently strong to support three hundred pounds applied at any point.

(5) A door or gate shall be provided at each entrance of the car. Each door or gate shall be equipped with an electric contact, and for cars equipped with doors away from the building or structure, a positive mechanical type lock shall be installed to prevent opening except at designated landings.

(6) Doors and gates and their guides, guide shoes, tracks, and hangers shall be so designed, constructed, and installed when the fully closed door or gate is subjected to a force of seventy-five pounds applied on an area of one foot square at right angles to and approximately at the center of the door or gate, it will not deflect beyond the line of the car sill. When subjected to a force of two hundred and fifty pounds, similarly applied, doors and gates shall not break nor be permanently deformed, and shall not be displaced from their guides or tracks.

(7) Gates shall be constructed of metal and shall be of a design which will reject a ball two inches in diameter.

(8) Doors or gates shall guard the full width and height of the car entrance opening.

[Order 70-11, § 296-87-090, filed 9/18/70, effective 10/21/70.]

WAC 296-87-100 Capacity posting. Every elevator shall be provided with a capacity plate and a data plate permanently and securely fastened in place. Capacity plates shall be located in a conspicuous place inside the car. Data plates shall be attached to the car crosshead. The height of the letters and figures shall be not less than one inch for capacity plates and one inch for data plates. Capacity plates shall indicate the rated load of the elevator in pounds.

[Order 70-11, § 296-87-100, filed 9/18/70, effective 10/21/70.]

WAC 296-87-110 Platform size. (1) Elevators shall not exceed five thousand pounds capacity and shall not exceed a speed of three hundred feet per minute, unless specifically authorized by the department of labor and industries for each installation.

(2) Maximum inside net platform areas for the various rated loads.

Rated Load (lbs.)	Square Feet
1,000	13.25
1,200	15.6
1,500	18.9
1,800	22.1
2,000	24.2
2,500	29.1
3,000	33.7
3,500	38.0
4,000	42.2
5,000	50.0

[Order 70-11, § 296-87-110, filed 9/18/70, effective 10/21/70.]

(1999 Ed.)

WAC 296-87-120 Maintenance inspection and test periods. (1) A full load overspeed safety test shall be performed before the elevator is put into operation and each time the elevator is moved to a new location a full load overspeed test and inspection shall be mandatory and approved by a state inspector.

(2) Periodic maintenance shall be made by an experienced elevator mechanic at not more than thirty days, or thirty shifts, whichever occurs first. Once each shift the equipment shall be inspected by the operator to determine that the equipment is in a proper operating condition. The erection and dismantling of any personnel elevator shall be under the direct supervision of a person experienced in this type of work.

(3) Following assembly and erection of hoists, and before being put in service, an inspection and test of all functions and safety devices shall be made under the supervision of a competent person. A similar inspection and test is required following major alteration of an existing installation. All hoists shall be inspected and tested at not more than three-month intervals. Records shall be maintained and kept on file for the duration of the job.

(4) All personnel hoists used by employees shall be constructed of materials and components which meet the specifications for materials, construction, safety devices, assembly, and structural integrity as stated in the American National Standard A10.4-1981, Safety Requirements for Workmen's Hoists.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-033 (Order 86-12), § 296-87-120, filed 1/10/86; Order 70-11, § 296-87-120, filed 9/18/70, effective 10/21/70.]

WAC 296-87-130 Car and counterweight buffers. An oil or spring buffer shall be provided for the car and counterweights except cars in excess of two hundred feet per minute shall require oil buffers.

[Order 70-11, § 296-87-130, filed 9/18/70, effective 10/21/70.]

Chapter 296-89 WAC

SAFETY REQUIREMENTS FOR BOAT LAUNCHING ELEVATORS

WAC

296-89-010	Definitions.
296-89-020	Car or platform enclosures.
296-89-030	Electric wiring.
296-89-040	Brakes.
296-89-050	Car operating and terminal stopping devices and electrical protective devices.
296-89-060	Cables.
296-89-070	Hoistway gates and doors.
296-89-080	Hoistway enclosures.

WAC 296-89-010 Definitions. (1) Boat launching elevator shall mean a boat launching device equipped with a car or platform which moves in guides in a substantially vertical direction and serves one or more floors or landings of a boat launching structure and a beach or water surface, and is used for the carrying or handling of boats in which people ride.

(2) Boat launching structure shall mean any structure which houses and supports any boat launching elevator.

[Order 70-11, § 296-89-010, filed 9/18/70, effective 10/21/70.]

WAC 296-89-020 Car or platform enclosures. All boat launching elevator cars or platforms shall be enclosed to a height of at least six feet from the floor on all sides where there are no hoistway doors or gates with solid panel or open-work which will reject a two inch ball.

[Order 70-11, § 296-89-020, filed 9/18/70, effective 10/21/70.]

WAC 296-89-030 Electric wiring. (1) All electric wiring used in conjunction with boat launching elevators shall be in rigid metal conduit except the traveling cable required between a terminal stopping switch mounted on the car or platform and the hoistway, which shall be of the flexible non-metallic moisture-retardent and flame-retardent type.

(2) All electrical outlets, switches, junction boxes and fittings used in conjunction with boat launching devices shall be of the weather-proof type.

[Order 70-11, § 296-89-030, filed 9/18/70, effective 10/21/70.]

WAC 296-89-040 Brakes. All electric boat launching elevators shall be equipped with effective brakes that are released electrically and applied by springs. The brakes shall be designed to have a capacity sufficient to hold the elevator at rest with its rated load.

[Order 70-11, § 296-89-040, filed 9/18/70, effective 10/21/70.]

WAC 296-89-050 Car operating and terminal stopping devices and electrical protective devices. (1) All electric boat launching elevators shall be equipped with a bottom terminal stopping switch which is operated by a float or other approved means and the necessary traveling cable attached to the car or platform.

(2) All electric boat launching elevators shall be equipped with a top terminal stopping switch located in the hoistway which is operated by a cam attached to the car, or by other approved means.

(3) All boat launching elevators having winding drum machines shall be equipped with a final stopping switch located on and operated directly by the driving machine. This final stopping switch shall not be driven by a chain, rope or belt.

(4) All boat launching elevators driven by a polyphase alternating current motor shall be equipped with the following approved relays:

(a) Reverse phase relay. A device which will prevent starting of the driving machine motor if the phase rotation is in the wrong direction, or if there is a failure in any phase.

(b) Main line relay. A relay or contact which will automatically interrupt the power to the driving machine motor and brake and cause the brake to be applied in event of operation of any of the safety devices.

(5) Operating switches for electric boat launching elevators shall be of the key-operated continuous pressure type located outside of the hoistway and within sight of the car or platform.

(6) Hand rope controls shall not be used for any boat launching elevator.

[Order 70-11, § 296-89-050, filed 9/18/70, effective 10/21/70.]

[Title 296 WAC—p. 1888]

WAC 296-89-060 Cables. The hoisting cables of all boat launching elevators shall be reshackled or refastened at the load end every twelve months.

[Order 70-11, § 296-89-060, filed 9/18/70, effective 10/21/70.]

WAC 296-89-070 Hoistway gates and doors. (1) All boat launching elevators shall be provided with hoistway entrance protection at every landing, except the beach or water surface landings, which shall comply with or be equivalent to the following minimum requirements.

(a) A full-bodied, balanced type safety gate which guards the full width of the hoistway opening and comes within two inches of the landing threshold at all points.

(b) Gate bodies shall be not less than forty-two inches in height above the threshold at the top landing and not less than sixty-six inches in height above the threshold at intermediate landings.

(c) Gates shall be constructed of metal or wood and shall be capable of withstanding a lateral pressure two hundred fifty pounds at any point without breaking or being permanently deformed, and without displacing the gate body from its guides or tracks.

(d) Openings in safety gate bodies of grille, lattice or other open work shall be of a design that will reject a two inch ball.

(2) All hoistway safety gates of a boat launching elevator shall be equipped with an approved combination electric contact and mechanical lock.

[Order 70-11, § 296-89-070, filed 9/18/70, effective 10/21/70.]

WAC 296-89-080 Hoistway enclosures. Boat launching elevator hoistway protection equal to and complying with all of the dimensional and pressure requirements of hoistway safety gates shall be provided on all other sides of the hoistway that are adjacent to a dock area platform, walkway or ramp.

[Order 70-11, § 296-89-080, filed 9/18/70, effective 10/21/70.]

Chapter 296-91 WAC

SAFETY REGULATIONS FOR CASKET LIFTS IN MORTUARIES

WAC

296-91-010	Scope.
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296-91-040	Electrical wiring, pipes and ducts in elevator hoistways and machine rooms.
296-91-050	Pits.
296-91-060	Protection of hoistway landing openings.
296-91-070	Hangers, guides and guide shoes for hoistway doors.
296-91-080	Location of hoistway doors.
296-91-090	Hoistway doors and door locking devices.
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296-91-140	Car frames and platform connections.
296-91-150	Capacity and loading.
296-91-160	Driving machine and sheaves.
296-91-170	Material and grooving for sheaves and drums.
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296-91-200	Ropes, rope connections, data and record.
296-91-210	Hydraulic elevators.
296-91-220	Valves, supply piping and fittings.
296-91-230	Stopping devices.

296-91-240 Operating devices.

WAC 296-91-010 Scope. This code applies to hoisting and lowering mechanisms equipped with cars which move in guides in a substantially vertical direction, the cars of which have a net inside area not exceeding twenty-eight square feet and a total internal height not exceeding four feet, and the width not to exceed three and one-half feet. The platform shall consist of a series of rollers and which are used exclusively for carrying caskets.

Hoistways, hoistway enclosures and related construction which is in substantial compliance with Part 1, section 100 of the American Standard Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks A17.1-1965 shall be deemed to meet the requirements of these regulations.

[Order 71-16, § 296-91-010, filed 12/7/71.]

WAC 296-91-020 Machine rooms and machinery spaces. Machines and their control equipment may be located inside the hoistway enclosure at the top or bottom without intervening enclosures or platforms. Machines and control equipment located outside the hoistway shall be enclosed in enclosures of incombustible material not less than six feet high. If of openwork material, the enclosure shall reject a ball two inches in diameter with a self-closing and locking door, except that control equipment located outside the hoistway may be enclosed in a metal cabinet equipped with a self-closing and locking door to prevent access by unauthorized persons. Permanent electric lighting shall be provided in all machine rooms and machinery spaces.

[Order 71-16, § 296-91-020, filed 12/7/71.]

WAC 296-91-030 Equipment in machine rooms. Only machinery and equipment required for the operation of the elevator shall be permitted in the elevator machine room.

[Order 71-16, § 296-91-030, filed 12/7/71.]

WAC 296-91-040 Electrical wiring, pipes and ducts in elevator hoistways and machine rooms. (1) Only such electrical wiring raceways and cables used directly in connection with the elevator may be installed inside the hoistway.

(2) Pipes or ducts conveying gases, vapors or liquids and not used in connection with the elevator shall not be installed in any hoistway, machine room or machinery space.

(3) Machinery and sheave beams, supports and foundations shall comply with Section 105 of the American Standard Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks A17.1-1965.

[Order 71-16, § 296-91-040, filed 12/7/71.]

WAC 296-91-050 Pits. Pits are not required.

[Order 71-16, § 296-91-050, filed 12/7/71.]

WAC 296-91-060 Protection of hoistway landing openings. The size and location of door openings shall conform to the following:

(1) Size of openings. The width and height of door openings shall not exceed the width and height of the elevator car by more than one inch in each dimension.

(1999 Ed.)

Exception: One door opening may be of sufficient size to permit installing and removing the car, but shall be not more than four feet nine inches in height.

(2) Location of door opening. The bottom of the door opening shall be not less than twenty-four inches above the floor.

[Order 71-16, § 296-91-060, filed 12/7/71.]

WAC 296-91-070 Hangers, guides and guide shoes for hoistway doors. Hoistway doors shall be so hung and guided that the doors will not be displaced from their guides or tracks when in normal service nor when the doors are subjected to a constant horizontal force of two hundred and fifty pounds applied at right angles to and approximately the center of the door or to the center of each door section where multisection doors are used.

[Order 71-16, § 296-91-070, filed 12/7/71.]

WAC 296-91-080 Location of hoistway doors. Hoistway doors shall be so located that the distance from the hoistway face of the doors to the edge of the hoistway landing sill measured from the face of the door section nearest to the car shall be not more than two and one-half inches.

[Order 71-16, § 296-91-080, filed 12/7/71.]

WAC 296-91-090 Hoistway doors and door locking devices. Hoistway doors shall be provided which will guard the full height and width of the openings and shall be provided with a combination mechanical locks and electric contacts.

[Order 71-16, § 296-91-090, filed 12/7/71.]

WAC 296-91-100 Protection of spaces below hoistways. Where the space below the hoistway is used for a passageway or is occupied by persons, or if unoccupied is not secured against unauthorized access, the cars and their counterweights shall be provided with safeties which may be operated as a result of the breaking of the suspension means and which may be of the inertia type without governors.

[Order 71-16, § 296-91-100, filed 12/7/71.]

WAC 296-91-110 Car doors or gates. (1) There shall be not more than two entrances to the car.

(2) Each entrance shall be provided with a car door or gate which when in fully closed position shall protect the full width and height of the car entrance opening.

(a) Collapsible type gates shall, when extended (closed position), reject a ball four and one-half inches in diameter.

[Order 71-16, § 296-91-110, filed 12/7/71.]

WAC 296-91-120 Car enclosures. (1) Extent of enclosures. Elevator car shall be permanently enclosed on all sides and the top.

(2) Securing of enclosures. The enclosure shall be securely fastened to the car platform and so supported that it cannot loosen or become displaced in ordinary service.

(3) Deflection of enclosure walls. The enclosure walls shall be of such strength and so designed and supported that when subjected to a pressure of seventy-five pounds applied

[Title 296 WAC—p. 1889]

horizontally at any point on the walls of the enclosure, the deflection will not reduce the running clearance to exceed one inch.

(4) Car top enclosure. Top of car enclosure shall be so designed and installed as to be capable of sustaining a load of three hundred pounds on any square area two feet on a side and one hundred pounds applied at any point. Simultaneous application of these loads is not required.

[Order 71-16, § 296-91-120, filed 12/7/71.]

WAC 296-91-130 Car frames and platforms. (1) Every elevator suspended by wire ropes shall have a car frame consisting of a crosshead, uprights (stiles), and a plank located approximately at the middle of the car platform and in no case farther from the middle than one-eighth of the distance from front of the platform.

(2) Guiding members. Car frames shall be guided on each guide rail by upper and lower guiding members attached to the frame.

(3) Materials for car frames and platform frames. Car frames and outside members of platform shall be made of steel.

[Order 71-16, § 296-91-130, filed 12/7/71.]

WAC 296-91-140 Car frames and platform connections. Connections between members of car frames and platform shall be riveted, bolted or welded and shall conform to the following:

(1) Bolts. Bolts where used through sloping flanges of structural members shall have boltheads of the tipped head type or shall be fitted with beveled washers.

(2) Nuts. Nuts used on sloping flanges of structural members shall seat on beveled washers.

(3) Welding. Welding of parts upon which safe operation depends shall be done in accordance with the appropriate standards established by the American Welding Society.

[Order 71-16, § 296-91-140, filed 12/7/71.]

WAC 296-91-150 Capacity and loading. (1) Driving machines, car and counterweight suspension means and overhead beams and supports shall be designed and installed to sustain the car with a structural capacity load based on the inside net platform area as indicated in Table No. 207.1 of the American Standard Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks A17.1-1965.

(2) Capacity plate. A metal plate shall be fastened in a conspicuous place in the car and shall give the rated load in letters and figures not less than one-fourth inch high stamped, etched or raised on the surface of the plate.

[Order 71-16, § 296-91-150, filed 12/7/71.]

WAC 296-91-160 Driving machine and sheaves. Types of power driving machines permitted. Driving machines shall be one of the following types:

- (1) Drum.
- (2) Traction.
- (3) Plunger.

[Order 71-16, § 296-91-160, filed 12/7/71.]

[Title 296 WAC—p. 1890]

WAC 296-91-170 Material and grooving for sheaves and drums. Material and grooving for sheaves and drums shall:

(1) Be of metal finished grooves.

(2) Have a pitch diameter not less than forty times the diameter of the rope.

[Order 71-16, § 296-91-170, filed 12/7/71.]

WAC 296-91-180 Driving machine brakes. The elevator driving machine shall be equipped with a friction brake applied by a spring or springs and released electrically. The brake shall be designed to have a capacity sufficient to hold the car at rest with its rated load.

[Order 71-16, § 296-91-180, filed 12/7/71.]

WAC 296-91-190 Terminal stopping devices. (1) Upper and lower normal stopping devices shall be provided at the top and bottom of hoistway.

(2) Final terminal stopping devices shall be provided and arranged to cause the electric power to be removed from the elevator driving machine motor and brake after the car has passed a terminal landing but so that under normal operating conditions it will not function when the car is stopped by the normal terminal stopping device.

(3) Elevators having traction machines shall have final terminal stopping switches located in the hoistway and operated by cams attached to the car.

(4) Elevators having winding-drum machines shall have final terminal stopping switches located on and operated by the driving machine, which shall not be driven by chain, rope or belt. Also, stopping switches shall be installed in the hoistway that are operated by cams attached to the car or counterweights.

(5) All elevators having winding-drum machines shall have a slack rope device with an electric switch of the enclosed manually reset type which will cause the electric power to be removed from the driving machine motor and brake if the hoisting ropes become slack.

[Order 71-16, § 296-91-190, filed 12/7/71.]

WAC 296-91-200 Ropes, rope connections, data and record. (1) Elevator cars shall be suspended by steel wire ropes. Only iron (low carbon steel) or steel wire ropes with fibre cores, having the commercial classification of "elevator wire rope" shall be used for the suspension of elevator cars and for the suspension of counterweights.

(2) The minimum number of hoisting ropes shall be three one-half inch ropes for traction elevators and two one-half inch ropes for drum type elevators.

(3) Fastenings shall be:

- (a) By individual tapered babbitted rope sockets or,
- (b) By other types of rope fastenings that meet the approval of the enforcing agency.

(4) The rope socket shall be of a type which will develop at least eighty percent of the braking strength of the strongest rope to be used in such fastenings and U-bolt type rope clips (clamps) shall not be used for load line fastenings.

[Order 71-16, § 296-91-200, filed 12/7/71.]

WAC 296-91-210 Hydraulic elevators. (1) Shall be of the plunger type.

(2) The plunger shall be securely attached to the car platform.

(3) Plungers composed of more than one section shall have the joints designed and constructed to carry in tension the weight of all plunger sections below the joints.

(4) Plungers shall be provided with solid metal stops to prevent the plunger from traveling beyond the limits of the cylinder. Stops shall be so designed and constructed as to stop the plunger from maximum speed in the "up" direction under full pressure without damage to the hydraulic system.

(5) Means shall be provided to collect any oil leakage.

[Order 71-16, § 296-91-210, filed 12/7/71.]

WAC 296-91-220 Valves, supply piping and fittings.

(1) Valves, piping and fittings shall not be subjected to working pressures exceeding those recommended by the manufacturer for the type of service for which they are used.

(2) Piping shall be so supported as to eliminate undue stresses at joints and fittings particularly at any section of the line subject to vibration.

(3) A shut-off valve shall be installed in the pit.

(4) Each pump shall be equipped with a relief valve conforming to the following requirements:

(a) Type and location. The relief valve shall be located between the pump and the check valve and shall be of such type and so installed in a by-pass connection that the valve cannot be shut off from the hydraulic system.

(b) Setting. The relief valve shall be pre-set to open at a pressure not greater than one hundred and twenty-five percent of the working pressure at the pump.

Exception: No relief valve is required for centrifugal pump driven by induction motors providing the shut-off or maximum pressure which the pump can develop is not greater than one hundred thirty-five percent of the working pressure at pump.

(c) Check valve. A check valve shall be provided and shall be so installed that it will hold the elevator car with rated load at any point when the pump stops or the maintained pressure drops below the minimum operating pressure.

[Order 71-16, § 296-91-220, filed 12/7/71.]

WAC 296-91-230 Stopping devices. (1) Normal stopping devices shall be installed at the top and bottom of the hoistway operated by cams attached to the car.

(2) Final terminal stopping devices are not required.

(3) Anti-creep leveling devices are not required.

[Order 71-16, § 296-91-230, filed 12/7/71.]

WAC 296-91-240 Operating devices. The operation of the elevator shall be from outside the hoistway only and shall be of the constant pressure or automatic types.

[Order 71-16, § 296-91-240, filed 12/7/71.]

(1999 Ed.)

Chapter 296-93A WAC

MATERIAL LIFTS

(Formerly chapter 296-93 WAC)

WAC

296-93A-010	What is the purpose of this chapter?
296-93A-020	How must a hoistway enclosure be built to ensure proper construction and fire safety?
296-93A-030	How must hoistway enclosure gates and doors be constructed?
296-93A-040	What requirements apply to lift hoistways that do not extend to the lowest levels of a building or structure?
296-93A-050	What requirements apply to lift hoist driving machines?
296-93A-070	What car enclosure requirements apply to lifts?
296-93A-080	How much running clearance is permitted between a car sill and a hoistway face?
296-93A-090	What requirements apply to car and counterweight guides?
296-93A-100	How much weight can be placed on a car frame and platform during loading and unloading?
296-93A-120	What requirements apply to car operating devices, terminal stopping devices and electrical protective devices?
296-93A-140	What requirements apply to car safeties?
296-93A-150	What requirements apply to lift brakes?
296-93A-160	What type of ropes, chains and rope connections must be used on a lift?
296-93A-170	What requirements apply to lift control stations?
296-93A-190	How must lift pits be constructed?
296-93A-200	Which lift landings must be illuminated?
296-93A-210	What signs must be posted on landings and lifts?
296-93A-220	What electrical wiring standards apply to the construction of lifts?
296-93A-230	What safety regulations apply to exposed equipment?
296-93A-240	What are the minimum maintenance requirements for lifts?
296-93A-250	Is an installation permit required?
296-93A-260	When are inspections of new installations, alterations or relocations required?
296-93A-270	How frequently will lifts be inspected and tested?
296-93A-280	When is a material lift operating permit required?
296-93A-290	Under what conditions is a five-year test administered?
296-93A-300	When must plans for installations, alterations and relocations be submitted?
296-93A-330	Is an annual operating permit required for a material lift?

WAC 296-93A-010 What is the purpose of this chapter? (1) This chapter defines a "material lift" as a fixed stationary conveyance that:

- (a) Has a car or platform moving in guides;
- (b) Serves two or more floors of a building or structure;
- (c) Has a vertical rise of at least five feet and no more than sixty feet;
- (d) Has a maximum speed of fifty feet per minute;
- (e) Is not part of a conveying system but is an isolated self-contained lift;
- (f) Travels only in an inclined or vertical direction;
- (g) Is operated or supervised by an individual designated by the employer;
- (h) Is installed in a commercial or industrial area not accessible to the general public; and
- (i) Must comply with chapter 296-24 WAC (General safety and health standards).

(2) This chapter attempts to ensure that material lifts will not carry people and that people working near them will not be endangered by their operation or failure. It establishes requirements for the construction, installation, and operation of material lifts. It allows certain conveyances designed solely to transport material and equipment to be constructed

to less stringent and costly standards than ASME/ANSI A17.1.

(3) This chapter **does not** apply to conveyances that lack a car (platform) and utilize rollers, belts, tracks, power conveyors, or similar carrying (loading) surfaces. (See ASME/ANSI B20.1.)

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-010, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-020 How must a hoistway enclosure be built to ensure proper construction and fire safety? Generally, hoistway enclosure construction is governed by local codes and ordinances. When not in conflict with a local code requirement, the enclosure must:

(1) Be built to a height of seven feet above each floor, landing and adjacent stairway tread.

(2) Extend (adjacent to the counterweights) the full height of the floor and eight inches beyond the counterweight raceway.

(3) Be constructed of either solid material or material with openings that do not exceed two inches in diameter.

The enclosure must be supported and braced so that it does not deflect more than one inch when subjected to a force of one hundred pounds applied perpendicularly at any point.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-020, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-030 How must hoistway enclosure gates and doors be constructed? Enclosure gates (doors) must be constructed according to the following standards:

(1) Guard the full width of each opening on every landing.

(2) Be built in one of the following styles:

(a) Vertically sliding.

(b) Bi-parting.

(c) Counter-balanced.

(d) Horizontally swinging.

(e) Horizontally sliding.

(3) Be constructed of either solid material or material with openings that do not exceed two inches in diameter.

(4) Be constructed with a distance of not more than two and one-half inches between a hoistway gate or hoistway door face and a landing sill edge.

(5) Be designed and guided to withstand (without being broken, permanently deformed, or displaced from their guides or tracks) a one hundred pound lateral pressure applied near their center.

(6) Employ a combination mechanical lock and electrical contact which prevents the operation of the lift when the doors or gates are open.

(7) Construct balanced type vertically sliding gates that extend no more than two inches from the landing threshold and no less than sixty-six inches above it.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-030, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-040 What requirements apply to lift hoistways that do not extend to the lowest levels of a building or structure? If the space directly below the hoistway is accessible, the following requirements must apply:

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(1) All lift counterweights must have safeties.

(2) All cars and counterweights must have either spring or oil buffers.

(3) Spring buffers must not fully compress when struck by a car carrying its rated load or by the counterweights when they are moving at the following speeds:

(a) For safeties operated by a governor, the tripping speed of the governor is the maximum striking speed.

(b) For safeties not operated by a governor, one hundred twenty-five percent of the rated speed is the maximum striking speed.

(4) Car and counterweight-buffer supports must be able to withstand any impact upon the buffer (without permanent deformation) while occurring at the following speeds:

(a) For safeties operated by a governor, the tripping speed of the governor at the rated capacity is the maximum impact speed.

(b) For safeties not operated by a governor, one hundred twenty-five percent of the rated speed is the maximum impact speed.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-040, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-050 What requirements apply to lift hoist driving machines? (1) Lift hoist driving machines must be one of the following types:

(a) Winding drum.

(b) Traction.

(c) Direct plunger.

(d) Hydraulic.

(e) Roped or chained hydraulic.

(f) Rack and pinion.

(g) Roller chain drive.

(h) Scissors.

(i) Screw.

(2) Overhead mounted driving machines must either be secured to the top of overhead beams or supported by the floor above. Driving machines cannot be suspended by hooks, cables, chains or similar devices.

(3) For traction machines, the diameter of drive sheaves cannot be less than thirty times the diameter of the hoisting cables. The diameters of all other sheaves cannot be less than twenty-one times this diameter.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-050, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-070 What car enclosure requirements apply to lifts? Lift cars must have their sides enclosed with solid panels or openwork that will reject a two-inch diameter ball. On the car sides where there is no door (gate), the enclosure must extend to a height of at least forty-eight inches from the floor. On the car side next to the counterweight runway, the enclosure must extend vertically to the car top or underside of the car crosshead and horizontally to at least six inches on each side of the runway.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-070, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-080 How much running clearance is permitted between a car sill and a hoistway face? Running

clearance between a car sill and a hoistway face must not exceed two inches.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-080, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-090 What requirements apply to car and counterweight guides? Car and counterweight guide rails must be fastened so they will not deflect more than one-eighth inch. They must also be strong enough to withstand, without deformation, the application of a car safety when the car is carrying its rated load and traveling at its rated speed.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-090, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-100 How much weight can be placed on a car frame and platform during loading and unloading? Car frames and platforms must be designed and constructed to withstand the impact of the maximum weight encountered during loading and unloading.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-100, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-120 What requirements apply to car operating devices, terminal stopping devices and electrical protective devices? If electrically operated, such devices must be enclosed. On lifts driven by winding drum machines, there must be a slack rope device employing an enclosed electric switch (manually reset type) which halts power to the drum and brake when the hoisting rope becomes slack.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-120, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-140 What requirements apply to car safeties? (1) Car safeties must be used on all material lifts which are suspended by wire ropes or chains. They must be able to stop and sustain a car carrying one hundred twenty-five percent of its rated load.

(2) On lifts driven by rack and pinion machines:

(a) Car safeties will consist of a freely rotating safety pinion, an overspeed governor and a safety device which may be mounted on the car.

(b) The rotating pinion driving the overspeed governor will travel on a stationary rack which is vertically mounted in the hoistway.

(c) The governor will actuate the safety device when the downward speed of the car reaches the tripping speed and will bring the car to a gradual stop.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-140, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-150 What requirements apply to lift brakes? On electric lifts, brakes must engage by springs and must release electronically. All brakes must have the ability to stop a car and hold it at rest while the car is carrying one hundred twenty-five percent of its rated load. At least one brake must be mounted on the worm shaft of the driving machine. On indirectly-driven lifts, brakes must engage when the driving mechanism fails.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-150, filed 11/4/97, effective 12/9/97.]

(1999 Ed.)

WAC 296-93A-160 What type of ropes, chains and rope connections must be used on a lift? (1) The following general requirements apply:

(a) Iron (low carbon steel) or steel wire ropes with fiber cores must be used to suspend cars and counterweights.

(b) The minimum safety factor for suspension ropes must be six times the manufacturer's rated breaking strength per rope.

(c) The car, the counterweight end of the car and the counterweight wire ropes (or the stationary hitch ends where multiple roping is used) must be fastened so that the looped ends of the turned back portion in the rope sockets are clearly visible. Fastenings must either be:

(i) Individual tapered, babbitted rope sockets; or

(ii) Other types of department approved rope fastenings.

(d) Rope sockets must develop at least eighty percent of the breaking strength of the strongest rope used in the sockets.

(e) U-bolt rope clips (clamps) cannot be used for load fastenings.

(f) A metal or plastic data tag must be securely attached to one of the wire rope fastenings each time the ropes are replaced or reshackled. The data tag must include:

(i) The diameter of the ropes in inches; and

(ii) The manufacturer's rated breaking strength.

(g) All replacements of wire rope or chain must be in accordance with the lift manufacturer's specifications.

(2) The following requirements apply to specific types of material lifts:

(a) Traction type lifts, must use at least three hoisting ropes.

(b) Lifts suspended by hoisting chains: The owner, operator and installer must comply with the chain manufacturer's specifications for maintenance, inspection, and application.

(c) Lifts using roller chain type lifting chains, must use chains with a six-to-one safety factor based on the ASME/ANSI minimum (not average) chain strength.

(d) Drum type lifts, must use either at least two hoisting ropes or a secondary, as well as, a primary load path to the hoist must be employed. Also, the cable secured to the drum must be at least one and one-half turns around the drum when the carrier is at its extreme limit of travel.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-160, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-170 What requirements apply to lift control stations? Lift control stations must be located out of reach of the lift car. They must have controls which are permanently and clearly labeled by function. The controls must have a stop switch which will halt electrical power to the driving machine and brake. This stop switch must:

(1) Be manually operated; and

(2) Have red operating handles or buttons; and

(3) Be conspicuously and permanently marked "STOP"; and

(4) Clearly indicate the stop and run position.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-170, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-190 How must lift pits be constructed? Lift pits must:

- (1) Have noncombustible floors.
- (2) Be designed to prevent the entry of ground water into the pit.
- (3) Have floors that are approximately level.
- (4) Have drains that are not directly connected to sewers.
- (5) Provide safe and convenient access to the pit.
- (6) Provide an approved ladder for pits deeper than three feet.

(7) Have nonperforated metal guards installed on the open sides of the counterweights where spring, solid or oil type buffers are attached. These guards must:

(a) Extend from a point not more than twelve inches above the pit floor to a point not less than seven feet or more than eight feet above the floor.

(b) Be fastened to a properly reinforced and braced metal frame which will be at least equal in strength and stiffness to No. 14 U.S. gauge sheet steel.

(c) Be omitted on the pit side where compensating chains or ropes are attached to the counterweight.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-190, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-200 Which lift landings must be illuminated? All landings must be illuminated.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-200, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-210 What signs must be posted on landings and lifts? Each lift must have the following two signs:

(1) A "CAPACITY" sign permanently fastened in the lift car and on each landing. This sign must indicate the rated load of the lift in pounds and be made of metal with two-inch high black letters on a yellow background.

(2) A "NO RIDERS" sign conspicuously and permanently fastened on the landing side of all hoistway gates (doors) and in the enclosure of each car. This sign must be made of metal with two-inch high black letters on a red background.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-210, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-220 What electrical wiring standards apply to the construction of lifts? All electrical wiring, installations, and equipment in hoistways and machine rooms must conform to the 1984 edition of the National Electrical Code.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-220, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-230 What safety regulations apply to exposed equipment? Washington Industrial Safety and Health Act standards (WAC 296-24-150) require that guards, to protect against accidental code, must cover all exposed gears, sprockets, sheaves, drums, ropes and chains.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-230, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-240 What are the minimum maintenance requirements for lifts? All owners of lifts described in this chapter, or their designated agent, are responsible for

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the maintenance of their lifts and parts. Minimum maintenance requirements are:

(1) All lifts described in this chapter, and their parts, must be maintained in a safe condition.

(2) All devices and safeguards required by this chapter must be maintained in good working order.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-240, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-250 Is an installation permit required? Lift installers:

(1) Before erecting, installing, relocating, or altering any material lift must obtain a department permit. (See WAC 296-86-090, Material lift installation, alteration and relocation fees, for the cost of the permit.)

(2) Before erecting, installing, relocating or altering any material lift must complete, in duplicate, a permit application form and receive department approval.

(3) Conspicuously post the permit at the installation site.

Lift installers do not need a permit to perform normal maintenance, repairs and part replacements when the replacement parts are equivalent to the original parts in material, strength, and design.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-250, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-260 When are inspections of new installations, alterations or relocations required? Inspections are required for each lift installation, alteration or relocation. Inspections must be conducted after the job is completed but before the lift is placed into service. The purpose of the inspection is to determine if the completed job satisfies the requirements of this chapter. The inspection must include testing the lifts safety devices at one hundred twenty-five percent of load capacity.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-260, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-270 How frequently will lifts be inspected and tested? The department's inspectors must inspect and test all material lifts at least once a year. To conduct their inspections and tests, department inspectors have the right, during reasonable hours, to enter into and upon any building or premises. Department inspectors will conduct their inspections and tests according to the requirements of this chapter.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-270, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-280 When is a material lift operating permit required? An operating permit, conspicuously posted near the lift, is required for each material lift operated in Washington state. Lift installers are not required to purchase operating permits while a lift is being erected.

[Statutory Authority: RCW 70.87.030. 97-22-069, § 296-93A-280, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-290 Under what conditions is a five-year test administered? A five-year test of the lift car and counterweight safety devices must be conducted under the following conditions:

(1) The test will be conducted by qualified people. A qualified person is either the representative of a firm that manufactures, installs or services material lifts or a person approved by the department.

(2) The car and counterweight safety devices must be tested while the car is carrying a capacity load.

(3) A report of the test results must be submitted to the department for approval.

[Statutory Authority: RCW 70.87.030, 97-22-069, § 296-93A-290, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-300 When must plans for installations, alterations and relocations be submitted? All plans must be submitted, in duplicate, to the department for approval before the installation, alteration, or relocation begins. The department's fee for checking plans is shown in WAC 296-86-050.

[Statutory Authority: RCW 70.87.030, 97-22-069, § 296-93A-300, filed 11/4/97, effective 12/9/97.]

WAC 296-93A-330 Is an annual operating permit required for a material lift? An annual operating permit is required for each material lift in operation. The annual fee is shown in WAC 296-86-060. No operating permit will be issued until this fee has been paid.

[Statutory Authority: RCW 70.87.030, 97-22-069, § 296-93A-330, filed 11/4/97, effective 12/9/97.]

Chapter 296-94 WAC

SAFETY RULES GOVERNING THE CONSTRUCTION, OPERATION, MAINTENANCE AND INSPECTION OF INCLINED PASSENGER LIFTS FOR PRIVATE USE

WAC

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WAC 296-94-010 Scope. These regulations apply to the construction, operation, maintenance, and inspection of all inclined passenger lifts for private use installed in the state of Washington.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-010, filed 1/10/86.]

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WAC 296-94-020 Definitions. (1) "Inclined passenger lift" means a device constructed and operated for transporting persons from one elevation to another and consisting essentially of a car or platform traveling on guide rails in an inclined plane. For the purpose of these rules, the terms "inclined passenger lifts" shall have the same meaning as the terms "passenger elevator" as defined by RCW 70.87.010 (4)(a).

(2) Devices installed indoors on stairways and utilizing chairs for carrying passengers are not considered as being inclined passenger lifts insofar as these regulations are concerned.

(3) "Enforcing authority" means the division of building and construction safety inspection services of the department of labor and industries.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-020, filed 1/10/86.]

WAC 296-94-030 Approval of plans and specifications. (1) Before commencing construction of any inclined passenger lift the owner shall submit complete plans and specifications to the enforcing authority for approval.

(2) Plans and specifications covering the installation of an inclined passenger lift shall be endorsed by a professional engineer before approval by the enforcing authority will be considered.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-030, filed 1/10/86.]

WAC 296-94-040 Protection required. If the car sides extend less than six feet above the floor of the car, there shall be no obstruction along the runway with the arc with a twenty-four inch radius whose center is the outer corner of the top rail of the car enclosure.

Exception: When solid guards are installed on the obstruction in both directions of travel which project at least fourteen inches in line with the direction of travel, the running clearance may be reduced to seven inches. The exposed edge of the guard shall be rounded to eliminate shear hazards.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-040, filed 1/10/86.]

WAC 296-94-050 Landing enclosures and gates—Where required. (1) Landing enclosures. Where a landing platform is provided or if a portion of an existing structure is used as a landing platform, it shall be protected by a railing no less than forty-two inches high.

(2) Landing gates. The opening in the railing shall be guarded by a gate to a height equal to that of the railing. The gates may be of the horizontally sliding or swing type and shall be equipped with a lock and an electrical contact to prevent movement of the car with a gate open.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-050, filed 1/10/86.]

WAC 296-94-060 Bumpers and buffers. (1) Solid bumpers. For rated speeds not exceeding fifty feet per minute, if spring or equivalent type buffers are not used, solid bumpers shall be installed.

(2) Construction and requirements for solid bumpers. Solid bumpers shall be made of wood or other suitable resili-

ient material of sufficient strength to withstand without failure the impact of the car with rated load or the counterweight, descending at one hundred fifteen percent of the rated speed. The material used shall be of a type which will resist deterioration or be so treated as to resist deterioration.

(3) Spring buffers. For speeds exceeding fifty feet per minute buffers of the spring type shall be installed.

(4) Construction and requirements for spring buffers. Spring buffers shall be constructed so as to have a minimum stroke of three-quarters of an inch and a maximum stroke of one and one-half inches and shall not be fully compressed when struck by the car with its rated load or counterweight traveling at one hundred fifteen percent of the rated speed.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-060, filed 1/10/86.]

WAC 296-94-070 Machinery beams and supports. (1) Securing of machinery beams and type of supports. All machinery and sheaves shall be so supported and secured as to effectually prevent any part becoming loose or displaced. Beams directly supporting machinery shall be of steel or sound timber or reinforced concrete.

(2) Loads on beams and supports. Loads on beams and their supports shall be computed as follows:

(a) The total load on the beams shall be equal to the weight of all apparatus resting on the beams plus twice the maximum load suspended from the beams.

(b) The load resting on the beams shall include the complete weights of the driving machine, sheaves, controller, etc.

(c) The load suspended from the beams shall include the sum of the tensions in all ropes suspended from the beams.

(3) Fastening of driving machines and sheaves to underside of beams. The elevator driving machine or sheaves shall not be fastened to the underside of the supporting beams at the top of the hoistway.

Exception: Idlers or deflecting sheaves with their guards and frames. Cast iron in tension shall not be used for supporting members for sheaves where they are hung beneath beams.

(4) Factor of safety of beams and supports. The factor of safety for beams and their supports shall be not less than:

- For steel 5
- For timber and reinforced concrete 6

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-070, filed 1/10/86.]

WAC 296-94-080 Platform area and rated load. (1) Rated load. The rated load shall not exceed seven hundred pounds.

(2) Platform area. The inside net platform area shall not exceed twelve square feet.

Exception: The net platform area may be increased by not more than three square feet provided that shelves or benches permanently affixed to the car structure reduce the standing area to twelve square feet.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-080, filed 1/10/86.]

WAC 296-94-090 Rated speed. The rated speed measured along the incline shall not exceed seventy-five feet per minute.

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[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-090, filed 1/10/86.]

WAC 296-94-100 Car and chassis construction. (1) Car and platform. Inclined lift cars shall have metal or combination metal and wood, or other materials of equal strength, frames and platforms. Car frames and platforms shall have a factor of safety of not less than five based on the rated load, all suitably prepared and/or protected for exposure to the weather.

(2) Chassis construction. Inclined lift chassis shall be constructed of metal, except for guiding members. Chassis shall have a factor of safety of not less than five, based on the rated load. The chassis guiding members shall be retained and/or enclosed in guide(s)/track(s) in such a manner that the chassis cannot be derailed.

(3) Use of cast iron. Cast iron shall not be used in the construction of any member of the car frame or chassis.

(4) Number of compartments. The car shall not have more than one compartment.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-100, filed 1/10/86.]

WAC 296-94-110 Car enclosures. (1) Enclosures required. Except at the entrance, cars shall be enclosed on all sides to a height of not less than forty-two inches. The enclosure material will be of a design that will reject a ball one and one-half inches in diameter.

(2) Securing of enclosures. The enclosure shall be securely fastened to the car platform and so supported that it cannot loosen or become displaced in ordinary service or on the application of the car safety or on buffer engagement.

(3) Deflection of enclosure walls. The enclosure walls shall be of such strength and so designed and supported that when subjected to a pressure of seventy-five pounds applied horizontally at any point on the walls of the enclosure, the deflection will not reduce the running clearance below three-quarter inch, nor to exceed one inch.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-110, filed 1/10/86.]

WAC 296-94-120 Car doors or gates. (1) Doors or gates required. A car door or gate which, when closed, will guard the opening to a height of at least forty-two inches, shall be provided at each entrance to the car. Car doors may be of solid or openwork construction which will reject a ball three inches in diameter.

(2) Door or gate electric contacts. Car doors or gates shall be provided with an electric contact which will prevent operation of the elevator by the operating device unless the car door or gate is within two inches of full closure.

(3) Manual operation. Car doors or gates shall be manually operated.

(4) Latching of swing gate. If the car gate is of the swing type opening outward from the car, the contact in WAC 296-94-140 shall not make until the gate is securely latched.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-120, filed 1/10/86.]

WAC 296-94-130 Use of glass and plastics. (1) Tempered safety glass and plastics. Tempered safety glass and

plastics conforming to the requirements of subsection (2) of this section may be used.

(2) Weather resistant plastics. Plastics shall be of a weather resistant type.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-130, filed 1/10/86.]

WAC 296-94-140 Data plates. (1) Capacity plates. A weather resistant capacity plate shall be provided by the manufacturer and fastened in a conspicuous place in the car stating the rated load in pounds, letters, and figures not less than one-fourth inch.

(2) Data plates. A metal data plate shall be provided by the manufacturer stating the weight of the car, speed, suspension means data, manufacturer's name, and the date of installation. It shall be fastened in a conspicuous place in the machine area.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-140, filed 1/10/86.]

WAC 296-94-150 Guide and track supports and fastenings. (1) Material. Guide rails, guide rail brackets, splice plates, and their fastenings shall be of steel or other metals conforming to the requirements of this section.

(2) Stresses and deflections. The guide rail brackets, their fastenings and supports, shall be capable of resisting the horizontal forces imposed by loading with a total deflection at the point of support not in excess of one-eighth inch. The guide rails shall not deflect in any direction more than one-fourth inch measured at the midpoint between brackets.

(3) Overall length of guide rails or tracks. The top and bottom ends of each run of guide rail shall be so located in relation to the extreme positions of travel of the car and counterweight that the car and counterweight guiding members cannot travel beyond the ends of the guide rails.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-150, filed 1/10/86.]

WAC 296-94-160 Counterweight guiding and construction. (1) Guiding. Counterweights, where used, shall be in a guide or track.

(2) Construction. Counterweights shall not be of sufficient weight to cause undue slackening of any car hoisting rope or chain during acceleration or retardation of the car. Counterweight weight section shall be mounted in structural or formed metal frames so designed as to retain weights securely in place.

Exception: Counterweights may be constructed of a single metal plate.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-160, filed 1/10/86.]

WAC 296-94-170 Car safeties and governors. (1) Where required. All inclined lifts shall be provided with a safety capable of stopping and sustaining the car with rated load.

(2) Operation of car safeties. The car safety shall be of the Type A or B and operated by a speed governor. The governor shall operate to set the safety at a maximum speed of one hundred forty percent of rated speed and on breakage of

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the hoisting ropes, the safety shall operate without appreciable delay and independently of the governor speed action.

(3) Location of speed governor. Where a speed governor is used, it shall be located where it cannot be struck by the car or counterweight in case of overtravel and where there is sufficient space for full movement of the governor parts and where it is accessible for examination.

(4) Opening of brake and motor control circuits on safety application. The motor-control circuit and the brake-control circuit shall be opened before or at the time the safety applies.

(5) Governor ropes. The governor ropes, where used, shall be of iron, steel, monel metal, or phosphor bronze not less than one-quarter inch in diameter. Tiller-rope construction shall not be used.

(6) Slack-rope and slack-chain devices for winding-drum and roller-chain type driving machines. Inclined lifts of the winding-drum type with rope suspension shall be provided with a slack-rope device of the manually reset type which will remove the power from the motor and brake if the car is obstructed in its descent and the hoisting ropes slacken.

Inclined lifts with roller-chain suspension shall be provided with a slack-chain device which will remove the power from the motor and brake if the car is obstructed in its descent and the hoisting chains slacken. This device need not be of the manually reset type if the chain sprockets are guarded to prevent the chain from jumping off the sprockets.

(7) Application of car safety. A car safety device which depends upon the completion or maintenance of an electric circuit for the application of the safety shall not be used. Car safeties shall be applied mechanically.

(8) Use of cast iron in car safeties. Cast iron shall not be used in the construction of any part of a car safety the breakage of which would result in failure of the safety to function to stop and sustain the car.

(9) Car safety tests. A test of the car safety shall be made with rated load in the car before the inclined lift is put into service. Governor operation of instantaneous-type safeties shall be tested at rated speed by tripping the governor by hand. Where speed governors are located on the car or chassis, testing shall be performed by obtaining sufficient slack rope and dropping the car.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-170, filed 1/10/86.]

WAC 296-94-180 Driving machines and sheaves. (1) Materials for drums and sheaves and minimum diameter. Winding drums, traction sheaves, and overhead and deflecting sheaves shall be of cast iron or steel, of a diameter of not less than thirty times the diameter of the wire hoisting ropes. The rope grooves shall be machined.

Exception: Where 8 x 19 steel ropes are used, the diameter of drums and sheaves may be reduced to twenty-one times the diameter of the rope.

(2) Factor of safety. The factor of safety, based on the static load (the rated load plus the weight of the car, ropes, counterweights, etc.) to be used in the design of driving machines and sheaves shall be not less than:

- (a) Eight for wrought iron and steel;
- (b) Ten for cast iron, cast steel, and other material.

(3) Set-screw fastenings. Set-screw fastenings shall not be used in lieu of keys or pins if the connection is subject to torque or tension.

(4) Friction gear, clutch mechanism, or coupling. Friction gear, clutch mechanism, or coupling shall not be used for connecting the drum or sheaves to the main driving gear.

(5) Use of cast iron in gears. Worm gearing having cast iron teeth shall not be used.

(6) Driving machine brakes. Driving machines shall be equipped with electrically released spring-applied brakes.

(7) Operation of brake. A single ground or short circuit, a counter-voltage, or a motor field discharge shall not prevent the brake magnet from allowing the brake to set when the operating device is placed in the stop position.

(8) Location of driving machine, alignment, and guarding of sheaves. The driving machine may be mounted on the car chassis or placed at a remote location. If remotely located, all intervening sheaves or sprockets shall be placed to ensure rope or chain travels in proper alignment. All sheaves or sprockets shall be guarded.

(9) Driving-machine roller-chain sprockets. Driving-machine roller-chain sprockets shall be steel and shall conform in all particulars of design and dimensions to ANSI B29.1-1963, Transmission Roller Chains and Sprocket Teeth.

(10) Screw machines. Screw machines shall not be used.

(11) Hydraulic driving machines. Hydraulic driving machines, where used, shall conform to ANSI A17.1. Roped hydraulic machines may be used.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-180, filed 1/10/86.]

WAC 296-94-190 Terminal stopping switches. (1) Terminal stopping switches. Upper and lower normal terminal stopping switches, operated by the chassis, shall be provided and set to stop the chassis at normal top and bottom terminals of travel.

(2) Final stopping switches. Final terminal stopping switches, operated by the chassis, shall be provided and set to stop the chassis should it overtravel the normal terminals.

(3) Slack cable switches. On winding drum machines, a slack cable switch may be used in lieu of a bottom final terminal switch.

(4) Operation of stopping devices. The final terminal stopping device shall act to prevent the movement of the chassis in both directions of travel. The normal and final terminal stopping devices shall not control the same switches on the controller unless two or more separate and independent switches are provided, two of which shall be closed to complete the motor and brake circuits in each direction of travel.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-190, filed 1/10/86.]

WAC 296-94-200 Operation. (1) Type of operation. The incline lift shall be operated by constant pressure or momentary pressure key switches at each landing and on the car. Key-operated switches shall be of the spring return type and shall be operated by a cylinder type lock having not less than five pin or five disc combination with the key removable

only when the switch is in the off position and shall be weatherproof.

(2) Emergency stop switches in cars. An emergency stop switch shall be provided on or adjacent to the car operating panel. Stop switches shall be of the manually opened and manually closed type with red handles or buttons and conspicuously marked "STOP." Where springs are used, their failure shall not prevent opening of the switch.

(3) Control and operating circuit requirements. The design and installation of the control and operating circuits shall conform to the following:

(a) Control systems which depend on the completion or maintenance of an electric circuit shall not be used for:

(i) Interruption of the power and application of the machine brake at the terminals;

(ii) Stopping of the car when the emergency stop switch in the car is opened or any of the electrical protective devices operate;

(iii) Stopping the machine when the safety applies.

(b) If springs are used to actuate switches, contactors, or relays to break the circuit to stop an elevator at the terminal, they shall be of the restrained compression type.

(4) Hand rope operation. Hand rope operation shall not be used.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-200, filed 1/10/86.]

WAC 296-94-210 Suspension means. (1) Types permitted. Where the chassis is suspended from the driving machine by a wire rope or roller chain, a single suspension means may be used. The suspension means shall be any one of the following:

(a) Steel elevator wire rope;

(b) Steel aircraft cable;

(c) Roller chain conforming to ANSI transmission roller chains and sprocket teeth.

(2) Types prohibited. Steel tapes shall not be used as suspension means.

(3) Minimum diameter of suspension means. The diameter of hoist rope(s) or cable(s) shall not be less than the following:

(a) One-quarter inch for elevator wire rope;

(b) Three-sixteenth inch for galvanized aircraft cable.

(4) Factor of safety of suspension means. The suspension means shall have a factor of safety of not less than eight based on the tension on the rope(s) or chain(s) when raising the carriage and its rated load. In no case shall the rated breaking strength of the rope(s) or chain(s) be less than four thousand pounds.

(5) Arc of contact of suspension means on sheaves and sprockets. The arc of contact of a wire rope on a traction sheave shall be sufficient to produce adequate traction under all load conditions. The arc of contact of a chain with a driving sprocket shall be not less than one hundred forty degrees.

(6) Idle turns of ropes on winding drums. All wire ropes anchored to a winding drum shall have not less than one full turn of rope on the drum when the car or counterweight has reached its limit of possible overtravel.

(7) Lengthening, splicing, repairing, or replacing suspension means. No car or counterweight wire rope shall be

lengthened or repaired by splicing broken or worn suspension chains shall not be repaired. If one wire rope or a chain of a set is worn or damaged and requires replacement, the entire set of ropes or chains shall be replaced. In the event that a worn chain is replaced, the drive sprocket shall also be replaced.

(8) Securing ends of suspension ropes in winding drums. The winding-drum ends of car and counterweight wire ropes shall be secured by clamps on the inside of the drum or by one of the methods specified in subsection (9) of this section for fastening wire ropes to car or counterweight.

(9) Fastening of rope suspension means to cars and counterweights. The car or counterweight ends of wire ropes shall be fastened by return loop, by properly made individual tapered babbitted sockets or by properly attached fittings as recommended by wire rope manufacturers. Clamps of the U-bolt type shall not be used.

Tapered babbitted rope sockets and the method of babbitting shall conform to the requirements of ANSI A17.1. The diameter of the hole in the small end of the socket shall not exceed the nominal diameter of the rope by more than three thirty-seconds of an inch.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-210, filed 1/10/86.]

WAC 296-94-220 Traveling cable(s). All traveling cable(s) shall be Type SO or ETT and shall conform to the requirements of the National Electrical Code ANSI CI-1975. Where circuits through the traveling cable(s) exceed thirty volts, a means will be provided to remove the power automatically upon parting of the traveling cable.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-220, filed 1/10/86.]

WAC 296-94-230 Electric wiring. (1) Wiring requirements. All wiring shall conform to the requirements of the National Electrical Code.

(2) Electrical connections. If the driving machine is mounted on the car chassis, electrical connections between the car and power source is to be provided with a means to remove power should connecting traveling cable part. All electrical connections to the moving chassis and the stationary connections shall be insulated flexible conductors, in accordance with the National Electrical Code article six hundred and twenty on elevators.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-230, filed 1/10/86.]

WAC 296-94-240 Track(s)/guide(s) supporting structure. All supporting structures shall meet the local building codes.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-240, filed 1/10/86.]

WAC 296-94-250 Means of egress. (1) Hand crank. A hand crank capable of moving the car in accordance with ANSI A17.1 shall be provided.

(2) Brake release. The machine brake shall be provided with a lever to release the brake allowing use of the hand crank.

(1999 Ed.)

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-032 (Order 86-11), § 296-94-250, filed 1/10/86.]

Chapter 296-95 WAC

ELECTRIC ELEVATORS—DIRECT PLUNGER AND ROPED HYDRAULIC ELEVATORS—ESCALATORS USED TO TRANSPORT PASSENGERS—ELECTRIC AND HAND-POWERED DUMBWAITERS AND HAND-POWERED ELEVATORS

WAC

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PART I
HOISTWAYS AND RELATED CONSTRUCTION
FOR ELECTRIC AND HYDRAULIC ELEVATORS

WAC 296-95-101 Scope. This part is a minimum standard for all existing electric elevators. It applies to other equipment only as referenced in the applicable part.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-101, filed 12/1/92, effective 1/1/93.]

Section 1
Hoistways

WAC 296-95-110 Hoistway enclosures. (1) Local laws and ordinances shall govern the fire-resistive requirements for the hatchway enclosures.

(2) Where doors and hoistway enclosures are not required to be fire resistant, the hoistway shall be enclosed with material, which may be solid or with openings that do not exceed 1/2 inch in diameter, to a height of 6 feet above each floor or landing and above the treads of adjacent stairways.

(3) Enclosures shall be so supported and braced as to deflect not over 1 inch when subjected to a force of 100# applied perpendicularly at any point. Adjacent to the counter-

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weights, the enclosure must extend the full height of the floor and extend 6 inches past the counterweight raceway.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-110, filed 12/1/92, effective 1/1/93.]

WAC 296-95-111 Windows in hoistway enclosures. Every hoistway-window opening ten stories or less above a thoroughfare, and every such window opening three stories or less above a roof of an adjacent building, shall be guarded on the outside by one of the following methods:

(1) By vertical bars at least 5/8 in. (16 mm) in diameter or equivalent, spaced not more than 10 in. (254 mm) apart, permanently and securely fastened in place;

(2) By metal-sash windows having solid-section steel muntins of not less than 1/8 in. (3.2 mm) thickness, spaced not more than 8 in. (203 mm) apart.

Exterior hoistway windows shall be identified with 4 in. (102 mm) high letters marked "elevator."

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-111, filed 12/1/92, effective 1/1/93.]

WAC 296-95-113 Pipes conveying gases, vapors, or liquids. All steam and hot water pipes in hoistway shall be covered to prevent direct spray onto elevator car if ruptured as per ANSI A17.1, Rule 102.2.

(1) All other pipes or ducts currently in the hoistway shall be securely fastened to prevent excessive vibration.

(2) No future pipes or ducts shall be installed in the hoistway unless they directly pertain to the operation of the elevator.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-113, filed 12/1/92, effective 1/1/93.]

WAC 296-95-115 Access for maintenance. Overhead sheave spaces requiring inspection and maintenance shall be provided with suitable access and decking to provide a safe space for personnel. Where decking does not cover the complete hoistway, guard rails shall be provided. Support shall be similar to that required for the top of an elevator car and may be made of either wood or metal compatible with the existing hoistway construction. Servicing from the top of the car is permitted if no ladder is required.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-115, filed 12/1/92, effective 1/1/93.]

WAC 296-95-116 Car number designation. In any building with more than one elevator a designating number (not less than two inches in height) shall be located at the door of the main entrance lobby, inside the car, on the machine and on the disconnect switch.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-116, filed 12/1/92, effective 1/1/93.]

Section 2
Machine Rooms and Machinery Spaces

WAC 296-95-121 Access to machine rooms and machinery spaces. Access doors to machine rooms and machinery spaces shall be kept closed and locked. The lock shall be of a spring type arranged to permit the door to be opened from the inside without a key.

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[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-121, filed 12/1/92, effective 1/1/93.]

WAC 296-95-122 Lighting. Permanent electric lighting and a grounded outlet shall be provided in all machine rooms and machinery spaces. The illumination shall be not less than 10 footcandles (108 lux) at the floor level.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-122, filed 12/1/92, effective 1/1/93.]

WAC 296-95-123 Service outlets. Service outlets in or on elevator cars, hoistways and machinery spaces shall be of the grounded type.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-123, filed 12/1/92, effective 1/1/93.]

WAC 296-95-124 Pipes conveying gases, vapors, or liquids. (1) All other pipes or ducts currently in the machine rooms and machinery spaces shall be securely fastened to prevent excessive vibration.

(2) No future pipes or ducts shall be installed in the machine rooms and machinery spaces.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-124, filed 12/1/92, effective 1/1/93.]

WAC 296-95-125 Protection from weather. Elevator machines and control equipment shall be protected from the weather.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-125, filed 12/1/92, effective 1/1/93.]

WAC 296-95-126 Guards. Gears, sprockets, sheaves, cables, tapes, belts and chains shall be fitted with suitable guards to prevent accidental contact as is practical. Openings in machine room floors above the hoistway shall be guarded to prevent common tools from falling into the hoistway below. Ventilation grids where exposed to the hoistway below shall be firmly bolted or secured to prevent accidental removal and shall be fitted with 1/2 inch wire mesh under the grid.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-126, filed 12/1/92, effective 1/1/93.]

Section 3 Pits

WAC 296-95-130 Access to pits. Means of access for authorized personnel shall be provided to all pits. Access doors, if provided, shall be kept closed and locked. Access ladders shall be installed in elevator pits 3 feet and deeper.

[Statutory Authority: Chapter 70.87 RCW. 95-04-005, § 296-95-130, filed 1/18/95, effective 3/1/95. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-130, filed 12/1/92, effective 1/1/93.]

WAC 296-95-131 Drains. Drains connected directly to sewers shall not be provided in pits. Sumps, with or without pumps, are permitted.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-131, filed 12/1/92, effective 1/1/93.]

WAC 296-95-132 Illumination of pits. A permanent lighting fixture shall be provided in all pits which shall pro-

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vide an illumination of not less than 5 footcandles at the pit floor. A light switch shall be provided and shall be so located as to be accessible from the pit access door. A permanent grounded outlet shall be provided in all pits.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-132, filed 12/1/92, effective 1/1/93.]

WAC 296-95-133 Counterweight pit guards. (1) Where practicable, unperforated metal guards shall be installed in the pit on the open side or sides on all counterweights where spring or solid-type buffers are used or where oil buffers attached to the counterweight are used.

Exception: Where compensating chains or ropes are attached to the counterweight the guard may be omitted on the side facing the elevator car to which the chains or ropes are attached.

(2) Design, construction and location of guards. Guards shall extend from a point not more than 12 in. above the pit floor to a point not less than 7 feet nor more than 8 feet above such floor, and shall be fastened to a metal frame properly reinforced and braced to be at least equal in strength and stiffness to No. 14 U.S. gauge sheet steel.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-133, filed 12/1/92, effective 1/1/93.]

Section 4 Protection of Spaces Below Hoistways

WAC 296-95-140 Spaces below hoistways. Where the space below the hoistway is not permanently secured against access, the following requirements shall be conformed to:

(1) Counterweights shall be provided with safeties.

(2) The cars and counterweight shall be provided with spring or oil buffers.

(3) Car and counterweight buffer supports shall be of sufficient strength to withstand without permanent deformation the impact resulting from buffer engagement at the following speeds:

(a) Governor tripping speed where the safety is governor operated;

(b) 125% of the rated speed where the safety is not governor operated.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-140, filed 12/1/92, effective 1/1/93.]

Section 5 Hoistway Entrances

WAC 296-95-150 Doors or gates required. (1) Passenger elevators. Hoistway landing openings for passenger elevators shall be provided with entrances which guard the full width and the height of the openings.

The panels of entrances used with automatic-operation passenger elevators shall have no hand latches or other hand operated door fastening devices, nor shall such panels have any handles or knobs on the hoistway side.

(2) Freight elevators. Hoistway landing openings for freight elevators shall be provided with entrances which guard the full width of the opening.

Gates and doors shall conform to the following requirements:

Balanced type vertically sliding hoistway gates shall extend from a point not more than 2 inches from the landing threshold to a point not less than 66 inches above the landing threshold. Gates shall be solid or shall be openwork of a design to reject a ball 2 inches in diameter and shall be so located that the distance from the hoistway face of the gate to the hoistway edge of the landing sill shall be not more than 2 1/2 inches. Gates shall be constructed of metal or wood and shall be so designed and guided that they will withstand a lateral pressure of 100# applied at approximately their center without breaking or being permanently deformed and without displacing the gate from its guides or tracks.

At the top landing a gate 66 in. (1.65 m) high may be used if there is not sufficient clearance for a 6 ft. (1.83 m) high gate. When the requirements of WAC 296-95-110 allow nonfire-resistive hoistway enclosures, a gate may be used. The door or gate may have a maximum 2 in. (51 mm) vertical opening between the landing sill and the door or gate. Openings in gates shall reject a ball 2 in. (51 mm) in diameter.

A gate made in two or more sections which overlap that slides or telescopes may be used provided that the openings shall reject a ball 3/8 in. (9.5 mm) in diameter.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-150, filed 12/1/92, effective 1/1/93.]

WAC 296-95-151 Closing of hoistway doors. (1) Horizontally sliding doors of automatic-operation elevators shall be provided with door closers arranged to close an open door automatically if the car for any reason leaves the landing zone.

(2) Horizontal swinging single or center-opening doors of automatic-operation elevators shall be self-closing.

(3) Door closers are not required for the swinging portion of combination horizontally sliding and swinging doors.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-151, filed 12/1/92, effective 1/1/93.]

WAC 296-95-152 Hoistway door vision panels. Manually operated or self-closing hoistway doors of the vertically or horizontally sliding type, for elevators with automatic or continuous-pressure operation, shall be provided with a vision panel except at landings of automatic-operation elevators where a hall position indicator is provided. In multisection doors, the vision panel is required in one section only, but may be placed in all sections. All horizontally swinging doors shall be provided with vision panels. Vision panels may be provided for any type of hoistway door irrespective of the type of operation of the elevator. Where provided, they shall conform to the following:

(1) The area of any single vision panel shall be not less than 25 in. squared (0.016 m squared), and the total area of one or more vision panels in any hoistway door shall be not more than 80 in. squared (0.051 m squared).

(2) Each clear panel opening shall reject a ball 6 in. (152 mm) in diameter.

(3) Muntins used between panel sections shall be of non-combustible material and of substantial construction. If located on the landing side, they shall be flush with the surface of the landing side of the door.

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(4) Panel openings shall be glazed with clear wire glass not less than 1/4 in. (6.3 mm) thick.

(5) The center of the panel shall be located not less than 54 in. (1.37 m) nor more than 66 in. (1.68 m) above the landing; except that for vertically sliding biparting counterbalanced doors, it shall be located to conform with the dimensions specified insofar as the door design will permit.

(6) The vision panels in horizontally swinging doors shall be located for convenient vision when opening the door from the car side.

(7) Wire-glass panels in power-operated doors shall be substantially flush with the surface of the landing side of the door.

(8) Vision panel frames shall be secured by means of nonreversible screws or other tamper proof fasteners.

(9) Vision panels which do not meet the requirements of subsections (1) through (8) of this section shall be protected by protective grilles made of number 15 gage stainless or galvanized steel in accordance with the following specifications:

(i) Grilles shall be sized to fit within or over the vision panel frame and completely cover the vision panel opening in the hoistway door.

(ii) Grilles shall be secured by means of nonreversible screws or other tamper proof fasteners.

(iii) Grilles shall contain openings which shall not be larger than 3 in. (19.1 mm) by 3/4 in. (19.1 mm) or 3 in. (19.1 mm) in diameter. Such openings shall be spaced at 1 in. (25.4 mm) center to center.

(iv) All edges shall be free of burrs and beveled.

(v) Grilles shall be installed on the hoistway side of the door.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-152, filed 12/1/92, effective 1/1/93.]

WAC 296-95-153 Door hangers. Door hangers for horizontal slide type entrances shall conform to the following:

(1) Means shall be provided to prevent the hangers from jumping the track.

(2) Stops shall be provided in the entrance assembly to prevent hangers from overrunning the end of the track.

(3) For power-operated doors, they shall be constructed to withstand, without damage or appreciable deflection, an imposed static load equal to four times the weight of each panel as applied successively downward and upward at the vertical center-line of the panel.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-153, filed 12/1/92, effective 1/1/93.]

WAC 296-95-154 Nonshearing astragals. On a vertically sliding, biparting, counterbalanced hoistway door, a fire-resistive, nonshearing, and noncrushing member of either the meeting or overlapping type shall be provided on the upper panel to close the distance between the rigid door sections when in contact with the stops. Rigid members which overlap the meeting edge, and center-latching devices are prohibited.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-154, filed 12/1/92, effective 1/1/93.]

WAC 296-95-155 Pull straps. (1) Manually operated vertical slide biparting entrances of elevators which can be

operated from the landings shall be provided with pull straps on the inside and outside of the upper panel where the lower edge of the upper panel is more than 6 ft. 6 in. (1.98 m) above the landing when the panel is in the fully open position.

(2) The length of the pull straps shall conform to the following:

(a) The bottom of the strap shall be not more than 6 ft. 6 in. (1.98 m) above the landing when the panel is in the fully opened position.

(b) The length of the strap shall not be extended by means of ropes or other materials.

Where pull straps are provided on the car side of doors of elevators which can be operated from the car only, the length of the pull straps shall conform to the requirements specified in subsection (2) of this section.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-155, filed 12/1/92, effective 1/1/93.]

WAC 296-95-156 Landing sill clearance. The clearance between the car-platform sill and the hoistway edge of any landing sill, or the hoistway side of any vertically sliding counterweighted, or of any vertically sliding counterbalanced biparting hoistway door, shall be not less than 1/2 in. (13 mm) where side car guides are used, and not less than 3/4 in. (19 mm) where corner car guides are used. The maximum clearance shall be not more than 1-1/2 in. (38 mm).

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-156, filed 12/1/92, effective 1/1/93.]

WAC 296-95-157 Threshold clearance. The maximum dimension from the hoistway door or gate face to the hoistway edge of the threshold shall not exceed 2-1/4 inches.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-157, filed 12/1/92, effective 1/1/93.]

WAC 296-95-158 Floor numbers. Elevator hoistways shall have floor numbers, not less than 4 inches in height, placed on the walls and/or doors of hoistways at intervals such that a person in a stalled elevator upon opening the car door 4 inches could determine the floor position.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-158, filed 12/1/92, effective 1/1/93.]

Section 6 Hoistway Door Locking Devices, Parking Devices, and Access

WAC 296-95-160 Hoistway door or gate locking devices. (1) Interlocks required for passenger elevators. Hoistway doors or gates for passenger elevators shall be equipped with hoistway-unit system hoistway-door interlocks.

(2) Interlocks required for freight elevators. Hoistway doors or gates for freight elevators shall be equipped with hoistway-unit system hoistway-door interlocks, or an approved type combination electric contact and mechanical lock.

(3) Location of locking devices. Combination locks and electric contacts, or interlocks shall be so located that they are not accessible from the landing side when the hoistway doors or gates are closed.

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[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-160, filed 12/1/92, effective 1/1/93.]

WAC 296-95-161 Elevator parking device. (1) Parking devices required. Elevators that are operated from within the car only shall have elevator parking devices installed at every landing that is equipped with an unlocking device. On elevators that are not operated from within the car only, an elevator parking device shall be provided at one landing and may be provided at other landings. This device shall be located at a height not greater than 6 ft. 11 in. (2.11 m) above the floor. Parking devices are not required for elevators having hoistway doors which are automatically unlocked when the car is within the landing zone.

(2) General design requirements. Parking devices shall conform to the following requirements:

(a) They shall be mechanically or electrically operated.

(b) They shall be designed and installed so that friction or sticking or the breaking of any springs used in the device will not permit opening or unlocking a door when the car is outside the landing zone of that floor.

(c) Springs, where used, shall be of the restrained compression type which will prevent separation of the parts in case the spring breaks.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-161, filed 12/1/92, effective 1/1/93.]

WAC 296-95-162 Access to hoistway. Hoistway door unlocking devices or hoistway access switches shall be provided on elevators having hoistway doors which are unlocked when closed with car at landing, or locked but openable from the landing by means effective only when the car is in the landing zone. Hoistway door unlocking devices may be provided at all landings for emergency purposes.

(1) Hoistway door unlocking devices. Hoistway door unlocking devices shall conform to the following:

(a) The device shall unlock and permit the opening of the hoistway door from the access landing irrespective of the position of the car.

(b) The device shall be designed to prevent unlocking the door with common tools.

(c) The operating means for unlocking the door shall be available to and used only by inspectors, elevator maintenance and repair personnel, and qualified emergency personnel.

(d) The unlocking-device keyway shall be located at a height not greater than 6 ft. 11 in. (2.11 m) above the floor.

(2) Hoistway access switches. Hoistway access switches shall conform to the following:

(a) The switch shall be installed only at the access landings.

(b) The switch shall be installed adjacent to hoistway entrance at the access landing with which it is identified.

(c) The switch shall be of the continuous-pressure spring-return type, and shall be operated by a cylinder-type lock having not less than five-pin or five-disk combination with the key removable only when the switch is in the "off" position. The lock shall not be operable by any key which will operate locks or devices used for other purposes in the building. The key or combination shall be available to and

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used only by inspectors and elevator maintenance and repair personnel.

(d) The operation of the switch at either access landing shall permit, and may initiate and maintain, movement of the car with the hoistway door at this landing unlocked or not in the closed position, and with the car door or gate not in the closed position, subject to the following:

(i) The operation of the switch shall not render ineffective the hoistway door interlock or electric contact at any other landing.

(ii) The car cannot be operated at a speed greater than 150 fpm (0.76 m/s).

(iii) For automatic and continuous-pressure operation elevators, provided:

(A) Landing operating devices of continuous-pressure operation elevators, and car and landing operating devices of automatic operation elevators shall first be made inoperative by means other than the access switch;

(B) Power operation of the hoistway door and/or car door or gate is inoperative.

(iv) Automatic operation by a car-leveling device is inoperative.

(v) The top-of-car operating device (see WAC 296-95-270) is inoperative.

(vi) The movement of the car initiated and maintained by the upper access switch shall be limited in the down direction to a travel not greater than the height of the car crosshead above the car platform, and limited in the up direction above the upper access landing to the distance the car apron extends below the car platform.

Where electrically operated switches, relays, or contactors are used to render inoperative the hoistway-door interlock or electric contact or the car door or gate electric contact, the control circuits shall be arranged to conform to the requirements of WAC 296-95-222 and in addition, to render the normal car and hall operation ineffective if any such switch, relay, or contactor fails to function in the intended manner.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-162, filed 12/1/92, effective 1/1/93.]

Section 7

Power Operation of Doors and Gates

WAC 296-95-165 Reopening device for power-operated car doors or gates. Where required a power-operated car door or gate shall be provided with a reopening device which will function to stop and reopen the car door or gate and the adjacent hoistway door in the event that the car door or gate is obstructed while closing. If the closing kinetic energy is reduced to 2-1/2 ft-lbf (3.39 J) or less, the reopening device may be rendered inoperative (see WAC 296-95-162 (2)(d)(i)).

For center-opening doors or gates, the reopening device shall be so designed and installed that the obstruction of either door or gate panel when closing will cause the reopening device to function.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-165, filed 12/1/92, effective 1/1/93.]

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WAC 296-95-166 Photo electric or electric eye devices. An elevator equipped with a photo electric or electric eye device for reopening of the car and hoistway doors shall be provided with a means that will automatically bypass the light ray if obstruction of the light ray for approximately 20 seconds has prevented the doors from closing. The light ray shall not be reestablished until the doors have fully closed.

Exception:

(1) Upon a sufficient showing of need by a hospital or a nursing home, the department may authorize an automatic bypass means that will cause the doors to close within 35 seconds after the expiration of the normal door open time.

(2) When smoke detectors are used to bypass photo electric or electric eye devices in accordance with ANSI A17.1-211.3A.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-166, filed 12/1/92, effective 1/1/93.]

PART II

MACHINERY AND EQUIPMENT FOR ELECTRIC ELEVATORS

WAC 296-95-200 Scope. This part is a minimum standard for all existing electric elevators. It applies to other equipment only as referenced in the applicable part.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-200, filed 12/1/92, effective 1/1/93.]

Section 1

Buffers and Bumpers

WAC 296-95-203 Buffers and bumpers. Car and counterweight buffers or bumpers shall be provided. Solid bumpers may be used in lieu of buffers:

- (1) Where the rated speed is 50 fpm (0.25 m/s) or less; or
- (2) Where Type C safeties are used.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-203, filed 12/1/92, effective 1/1/93.]

Section 2

Counterweights

WAC 296-95-205 Counterweights. On rod type counterweights, the rod nuts shall be cotter-pinned and the tie rods shall be protected so that the head weight cannot crush the tie rods on buffer engagement.

The weights shall be protected so that they cannot be dislodged.

Compensating chains or ropes shall be fastened to the counterweight frame directly or to a bracket fastened to the frame and shall not be fastened to the tie rods.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-205, filed 12/1/92, effective 1/1/93.]

Section 3

Car Frames and Platforms

WAC 296-95-206 Car platforms. Every elevator car shall have a platform consisting of a nonperforated floor attached to a platform frame supported by the car frame, and extending over the entire area within the car enclosure. Holes

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in the floor for the safety plank wrench, etc., shall be covered and secured. The platform frame members and the floor shall be designed to withstand the forces developed under the loading conditions for which the elevator is designed and installed.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-206, filed 12/1/92, effective 1/1/93.]

WAC 296-95-207 Platform guards (aprons). The entrance side of the platform of passenger and freight elevators equipped with leveling devices or truck-zoning devices shall be provided with smooth metal guard plates of not less than 0.0598 in. (1.519 mm) thick steel, or material of equivalent strength and stiffness, adequately reinforced and braced to the car platform and conforming to the following:

(1) It shall extend not less than the full width of the widest hoistway door opening.

(2) It shall have a straight vertical face, extending below the floor surface of the platform, of not less than the depth of the leveling of truck zone, plus 3 in. (76 mm).

(3) If new guards are installed, the lower portion of the guard shall be bent back at an angle of not less than 60° nor more than 75° from the horizontal.

(4) The guard plate shall be securely braced and fastened in place to withstand a constant force of not less than 150 lbf (667 N) applied at right angles to and at any position on its face without permanent deformation.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-207, filed 12/1/92, effective 1/1/93.]

WAC 296-95-208 Hinged platform sills. Hinged platform sills, where provided, shall be provided with electric contacts which will prevent operation of the elevator by the normal operating device unless the hinged sill is within 2 in. (51 mm) of its fully retracted position.

The elevator may be operated by the leveling device in the leveling zone with the sill in any position.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-208, filed 12/1/92, effective 1/1/93.]

WAC 296-95-209 Floating (movable) platforms. Floating (movable) platforms which permit operation of the elevator when the car door or gate is not in the closed position are prohibited.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-209, filed 12/1/92, effective 1/1/93.]

Section 4 Car Enclosures

WAC 296-95-215 Car enclosures. Car enclosures for freight and passenger cars shall conform with the following:

(1) Freight elevator cars shall be enclosed to a height of at least 6 ft. from the floor on all sides, where there are no hoistway doors or gates, with solid panel or openwork which will reject a 2-inch ball. On the side of the car adjacent to the counterweight runway and extending 6 inches each side of the counterweight runway, the enclosure shall extend to the car top or underside of car crosshead. Overhead protection of solid or openwork material: If openwork, it shall reject a 1-1/2 inch ball and shall be sufficiently strong to support 300#

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applied at any point. Simultaneous application of these loads is not required. Suitable overhead protection may be installed directly over the area where the operator runs the controls, providing the overhead protection covers sufficient area for safe protection of operator.

(2) Passenger elevator cars shall be fully enclosed on all sides and the top, except the opening for entrances. It shall be of metal or wood in conformity with the local fire regulations. The car top shall be capable of sustaining a load of 300# applied at any point. Simultaneous application of these loads is not required.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-215, filed 12/1/92, effective 1/1/93.]

WAC 296-95-216 Material for passenger car enclosure. Material for passenger car linings shall comply with the following:

(1) Carpeting without padding may be used for interior finishes provided it shall have a Class I rating, flame spread of 25 or less which must include all the components of assembly other than the adhesive. The adhesive shall be a slow-burning type;

(2) Slow-burning combustible materials other than carpet may be used for interior finishes provided they have a Class II rating or better (flame spread of 75 or less), which must include all components of assembly other than the adhesive. Materials shall be firmly bonded flat to the enclosure and shall not be padded. Fabric materials with spray-type fireproofing shall not be installed in elevators.

Equivalent ratings in watts per centimeter squared as derived in the radiant panel test are also acceptable.

.45 watts/cm squared or higher is equivalent to Class I or better.

.22 watts/cm squared or higher is equivalent to Class II or better.

In the radiant test, the higher the number the better the resistivity to flame. In the Class I and II system, the lower the number, the better the resistivity to flame.

Smoke density of materials shall be less than 450 when tested in accordance with UBC Standard No. 42-1; and

(3) Certification that the materials and assembly meet these requirements shall be submitted to the building official.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-216, filed 12/1/92, effective 1/1/93.]

WAC 296-95-220 Car doors and gates. (1) Car doors or gates shall be required at each entrance to the elevator car.

(2) Car doors or gates may be horizontal or vertical sliding.

(3) Gates, except collapsible, may be solid or may be openwork of a design to reject a ball 2 inches in diameter. Gates shall be constructed of metal or wood and shall be so designed that they will withstand a lateral pressure of 100# applied at approximately their center without breaking or being permanently deformed and without displacing the gate from its guides or tracks.

(4) Collapsible gates shall reject a 3-inch diameter ball when fully extended (closed position) when installed on passenger cars and shall reject a 4-1/2 inch ball when fully extended (closed position) when installed on freight cars.

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Such gates shall not be power-opened for more than one-third of their clear opening distance or for a maximum power opening distance not to exceed 10 inches. Collapsible gates shall have at least every fourth vertical member guided at the top and every second vertical member guided at the bottom.

(5) Handles of manually operated collapsible gates nearest the car operating device on elevators operated from the car only shall be so located that the nearest handle is not more than 48 in. (1.22 m) from the car operating device when the gate is closed (extended position), and not more than 48 in. (1.22 m) above the car floor. Gate handles shall be provided with finger guards.

(6) Car doors and gates when in the fully closed position shall conform to the following:

(a) For passenger cars they shall protect the full width and height of the car entrance opening provided that vertically sliding gates may extend from a point not more than 1 inch above the car floor to a point not less than 6 ft. above the floor.

(b) For freight elevators they shall protect the full width of the car entrance opening. Car doors shall extend from the car floor to a height of not less than 6 ft. above the car floor. Vertically sliding gates shall extend from a point not more than 1 inch above the car floor to a point not less than 6 ft. above the car floor.

(7) Car doors and gates of electric and electro-hydraulic elevators shall be equipped with approved car door or gate electric contacts which will prevent operation of the elevator by the normal operating device unless the car door or gate is in the closed position.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-220, filed 12/1/92, effective 1/1/93.]

WAC 296-95-221 Location of car doors and gates. All elevators, except freight elevators equipped with horizontally swinging doors which are not accessible to the general public and located in factories, warehouses, garages, and similar buildings, shall conform to the following requirements:

(1) Location. Doors or gates for automatic or continuous-pressure operation elevators shall be so located that the distance from the face of the car door or gate to the face of the hoistway door shall be not more than the following:

(a) Where a swinging-type hoistway door and a car gate are used, 4 in. (102 mm);

(b) Where a swinging-type hoistway door and a car door are used, 5-1/2 in. (140 mm);

(c) Where a sliding-type hoistway door and a car gate or door are used, 5-1/2 in. (140 mm).

(2) Measurement of distances. The distances specified shall be measured as follows:

(a) Where a multisection car door and multisection hoistway door are used or where one of these doors is multisection and the other is single section, between the sections of the car door and the hoistway doors nearest to each other;

(b) Where a multisection car door and a swinging-type hoistway door are used, between the hoistway door and the section of the car door farthest from it. Where space conditions require the use of three speed car doors, the distance shall be measured from the intermediate speed panel;

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(c) Where a car gate is used, between the car gate and the section of the hoistway door nearest to the car gate.

(3) Space guards. Where existing distances are greater than specified by subsections (1) and (2) of this section, a space guard of sheet metal shall be provided, attached to the hoistway door and/or car door. The guard is to be mounted to the door by a tamper-proof means. The bottom of the guard shall be not less than 1/8 in. (3.2 mm) nor more than 1/2 in. (13 mm) from the edge of the sill and shall be not more than 1/2 in. (13 mm) above the sill. The face of the guard shall run vertically not less than 40 in. (1.01 m) nor more than the height of the lower edge of the vision panel. The guard shall extend the full width of the door. The top of the guard shall be inclined toward the face of the door at an angle of not less than 60° nor more than 75° from the horizontal. Exposed edges shall be beveled or rolled to eliminate sharp edges. The guard shall be sufficiently rigid or reinforced to prevent collapsing or denting. Mounting of the guard shall have proper clearances at the bottom and sides to permit easy closing of the door and shall not interfere with the self-closing. On multisection horizontally sliding doors only the leading or fast panel shall be fitted with the space guard. For swinging doors, the sides of the guard shall be closed if the depth exceeds 5 in. (127 mm). (See also Appendix A.)

(4) Sight guards. On horizontally sliding hoistway doors where existing clearances are greater than specified by subsections (1) and (2) of this section, a vertical sight guard shall be mounted to the leading edge of the hoistway door. The sight guard shall be mounted with a vertical clearance of not more than 1/2 in. (13 mm) to the sill, to a height of not less than 6 ft. (1.8 m) and shall project from the door, a distance to not more than 1/2 in. (13 mm) nor less than 1/8 in. (3.2 mm) from the hoistway edge of the sill. (See also Appendix A.)

(5) Devices for making hoistway door interlocks or electric contacts, or car door or gate electric contacts inoperative. Devices other than those specified below shall not be provided to render hoistway door interlocks, the electric contacts of hoistway door combination mechanical locks and electric contacts, or car door or gate electric contacts inoperative:

(a) Leveling devices;

(b) Truck-zoning devices;

(c) Hoistway access switch.

Existing devices which do not conform to the above shall be removed.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-221, filed 12/1/92, effective 1/1/93.]

WAC 296-95-222 Control and operating circuit requirements. The failure of any single magnetically operated switch, contactor, or relay to release in the intended manner, or the occurrence of a single accidental ground, shall not permit the car to start or run if any hoistway door interlock is unlocked or if any hoistway door or car door or gate electric contact is not in the closed position.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-222, filed 12/1/92, effective 1/1/93.]

WAC 296-95-225 Emergency exits. (1) Top emergency exits. Cars provided with a car top emergency exit. Top emer-

agency exit covers shall be hinged or otherwise attached to the car top so that the cover can be opened from the top of the car only and opens outward.

The exit cover of the lower compartment of a multideck elevator car shall be openable from either compartment.

(2) Side emergency exits. Side emergency exit doors or panels, where provided, shall have a lock arranged so that the door may be opened from the inside of the car only by a special shaped removable key and outside the car by means of a nonremovable handle. All side emergency car exits shall be equipped with electric contacts to prevent the movement of the car if the exit door or panel is not closed. Side emergency exit door panels shall open only into the car.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-225, filed 12/1/92, effective 1/1/93.]

WAC 296-95-226 Car illumination. (1) Interiors of cars shall be provided with an electric light or lights. Not less than two lamps shall be provided.

(2) The minimum illumination at the car threshold, with the door closed, shall not be less than:

(a) For passenger elevators: 5 ftc (54 lx);

(b) For freight elevators: 2-1/2 ftc (27 lx).

(3) Light control switches are not required, but if provided they shall be located in or adjacent to the operating device in the car. In elevators having automatic operation, they shall be of the key-operated type or located in a fixture with a locked cover.

(4) Top of car light fixtures shall be provided with a non-key-operated switch in or adjacent to the fixture.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-226, filed 12/1/92, effective 1/1/93.]

Section 5 Safeties

WAC 296-95-227 Car safeties. The car of every elevator suspended by wire ropes shall be provided with car safeties. The safety device shall be capable of stopping and sustaining the entire car with its rated load in the event of cable severance or overspeed. There shall be a switch provided on the car actuated by the setting of the safeties that will remove the electric power from the driving machine motor and brake. Car safety devices (safeties) are identified and classified on the basis of performance characteristics after the safety begins to apply pressure on the guide rails.

(1) Type A safeties. Safeties which develop a rapidly increasing pressure on the guide rails during the stopping interval, the stopping distance being very short due to the inherent design of the safety. The operating force is derived entirely from the mass and the motion of the car or the counterweight being stopped. These safeties apply pressure on the guide rails through eccentrics, rollers, or similar devices without any flexible medium purposely introduced to limit the retarding force and increase the stopping distance.

(2) Type B safeties. Safeties which apply limited pressure on the guide rails during the stopping interval, and which provide stopping distances that are related to the mass being stopped and the speed at which application of the safety is initiated. Retarding forces are reasonably uniform after the safety is fully applied. Continuous tension in the governor

rope may or may not be required to operate the safety during the entire stopping interval. Minimum and maximum distances are specified on the basis of governor tripping speed.

(3) Type C safeties (Type A with oil buffers). Safeties which develop retarding forces during the compression stroke of one or more oil buffers interposed between the lower members of the car frame and a governor-operated Type A auxiliary safety plank applied on the guide rails. The stopping distance is equal to the effective stroke of the buffers.

(4) Type G safeties. Safeties similar to Type B except having a gradually increasing retarding force. This safety may be either of the wedge clamp type or the flexible guide clamp type applied by a cable which unwinds a drum below the car floor.

(5) Slack rope safeties that are actuated by the slackening or breaking of the hoisting ropes. This type of safety is not actuated by an overspeed governor.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-227, filed 12/1/92, effective 1/1/93.]

WAC 296-95-228 Maximum permissible movement of governor rope to operate the safety mechanism. For all Type B safeties the movement of the governor rope relative to the car or the counterweight, respectively, required to operate the safety mechanism from its fully retracted position to a position where the safety jaws begin to exert pressure against the guide rails shall not exceed the following values based on rated speed:

(1) For car safeties:

(a) 200 fpm (1.02 m/s) or less: 42 in. (1.07 m);

(b) 201 fpm (1.03 m/s) to 375 fpm (1.91 m/s); 36 in. (914 mm);

(c) Over 375 fpm (1.91 m/s): 30 in. (762 mm).

(2) For counterweight safeties: 42 in. (1.07 m) for all speeds.

Drum-operated car and counterweight safeties, requiring continual unwinding of the safety drum rope to fully apply the safety, shall be so designed that not less than three turns of the safety rope will remain on the drum after the overspeed test of the safety has been made with rated load in the car.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-228, filed 12/1/92, effective 1/1/93.]

WAC 296-95-229 Rail lubricants and lubrication plate. Rail lubricants or coatings which will reduce the holding power of the safety or prevent its functioning as required shall not be used.

A metal plate shall be securely attached to the car cross-head in an easily visible location and, where lubricants are to be used, shall carry the notation, "Consult manufacturer of the safety for the characteristics of the rail lubricant to be used." If lubricants are not to be used, the plate shall so state.

If lubricants other than those recommended by the manufacturer are used, a safety test should be made to demonstrate that the safety will function as required.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-229, filed 12/1/92, effective 1/1/93.]

**Section 6
Speed Governors**

WAC 296-95-235 Governors. A speed governor or inertia trip safety or a slack cable operated safety shall be installed on all elevators and shall be so designed that it will actuate the car safeties before the car attains a speed of one hundred forty percent of the rated speed. Governor ropes shall be not less than 3/8 inch in diameter, if iron or steel rope, and not less than 3/4 inch manila rope. Tiller rope shall not be used.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-235, filed 12/1/92, effective 1/1/93.]

WAC 296-95-236 Speed governor overspeed and car safety mechanism switches. A switch shall be provided on the speed governor and operated by the overspeed action of the governor when used with Type B and C car safeties of elevators having a rated speed exceeding 150 fpm (0.76 m/s). A switch shall be provided on the speed governor when used with a counterweight safety for any car speed. For static control, an overspeed switch shall be provided regardless of rated speed and shall operate in both directions of travel.

These switches shall, when operated, remove power from the driving-machine motor and brake before or at the time of application of the safety.

Switches used to perform the function specified shall be positively opened and remain open until manually reset. Switches operated by the car safety mechanism shall be of a type which will not reset unless the car safety mechanism has been returned to the off position.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-236, filed 12/1/92, effective 1/1/93.]

**Section 7
Capacity and Loading**

WAC 296-95-240 Minimum rated load for passenger elevators. The rated load in pounds (kilograms) for passenger elevators shall be based on the inside net platform areas, and shall be not less than shown in the table below.

The inside net platform areas shall be determined as shown in Table 3.7.1 which shows the maximum inside net platform areas for the various common rated loads. If other rated loads are used, they shall be not less than as follows:

(1) For an elevator having an inside net platform area of not more than 50 ft. squared (4.65 m squared), $W = 0.667A$ squared + 66.7A;

(2) For an elevator having an inside net platform area of more than 50 ft. squared (4.65 m squared), $W = 0.0467A$ squared + 125A - 1367;

where

A = inside net platform area, ft. squared (m squared)

W = minimum rated load, lb. (kg)

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**TABLE 3.7.1
MAXIMUM* INSIDE NET PLATFORM AREAS FOR THE VARIOUS RATED LOADS**

Rated Load, lb	Inside Net Platform Area, ft ²	Rated Load, lb	Inside Net Platform Area, ft ²
800	7.0	6,000	80.0
900	8.3	6,500	87.7
700	8.8	7,000	95.3
1,000	13.25	8,000	121.8
1,200	15.6	9,000	148.3
1,500	18.9	10,000	180.0
1,800	22.1	12,000	243.0
2,000	24.2	15,000	318.1
2,500	29.1	18,000	393.2
3,000	33.7	20,000	468.3
3,500	38.0	25,000	593.4
4,000	42.2	30,000	718.5
4,500	46.2		

* To allow for variations in cab design, an increase in the maximum inside net platform area not exceeding 5%, shall be permitted for the various rated loads.

GENERAL NOTE:

1 lb = 0.454 kg

1 ft² = 0.29 m²

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-240, filed 12/1/92, effective 1/1/93.]

WAC 296-95-241 Use of partitions for reducing inside net platform area. Where partitions are installed in elevator cars for the purpose of restricting the platform net area for passenger use, they shall be permanently fastened in place. Gates, doors, or handrails shall not be used for this purpose. Partitions shall be so installed as to provide for approximately symmetrical loading.

When conditions do not permit symmetrical loading, guide rails, car frame, and platforms shall be capable of sustaining the resulting stresses and deflections.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-241, filed 12/1/92, effective 1/1/93.]

WAC 296-95-243 Minimum rated load for freight elevators. (1) Minimum load permitted. The minimum rated load for freight elevators in pounds (kilograms) shall be based on the weight and class of the load to be handled, but shall in no case be less than the minimum specified in subsection (2) of this section for each class of loading based on the inside net platform area.

(2) Classes of loading and design requirements. Freight elevators shall be designed for one of the following classes of loading:

(a) Class A—General freight loading. Where the load is distributed, the weight of any single piece of freight or of any single hand truck and its load is not more than one-quarter the rated load of the elevator, and the load is handled on and off the car platform manually or by means of hand trucks.

For this class of loading, the rated load shall be based on not less than 50 lb./ft. squared (244 kg./m squared) of inside net platform area.

(b) Class B—Motor vehicle loading. Where the elevator is used solely to carry automobile trucks or passenger automobiles up to the rated load of the elevator.

For this class of loading, the rated load shall be based on not less than 30 lb./ft. squared (146 kg./m squared) of inside net platform area.

(c) Class C—Industrial truck loading. Where the load is carried in transit or is handled on and off the car platform by means of power industrial trucks or by hand trucks having a loaded weight more than one-quarter the rated load of the elevator.

[Title 296 WAC—p. 1909]

For this class of loading the following requirements shall apply:

- (i) The rated load shall be based on not less than 50 lb./ft. squared (244 kg./m squared) of inside net platform area;
- (ii) The weight of the loaded industrial truck shall not exceed the rated load of the elevator;
- (iii) The weight of the loaded industrial truck plus any other material carried on the elevator shall not exceed the rated load when the industrial truck is also carried;
- (iv) During loading and unloading, the load on the elevator shall in no case exceed one hundred fifty percent of the rated load, and where this load exceeds the rated load, the capacity of the brake and the traction relation shall be adequate to safely sustain and level at least one hundred fifty percent of the rated load.

Note: When the entire rated load is placed on the elevator by the industrial truck in increments, the load imposed on the car platform while the last increment is being loaded or the first increment unloaded will exceed the rated load by the weight of the empty industrial truck.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-243, filed 12/1/92, effective 1/1/93.]

WAC 296-95-244 Capacity plates. (1) Every elevator shall be provided with a capacity plate or a painted sign permanently and securely fastened in place and located in a conspicuous position inside the car. It shall indicate the rated load of the elevator in pounds, and for freight elevators, this plate or sign shall indicate:

- (a) The capacity for lifting one-piece loads;
 - (b) For freight elevators used for industrial truck loading where the truck is not usually carried by the elevator but used only for loading and unloading, the maximum load the elevator is designed to support while being loaded or unloaded.
- (2) Capacity plates shall be durable and readily legible. The height of the letters and figures shall be not less than:
- (a) 1/4 in. (6.3 mm) for passenger elevator capacity plates;
 - (b) 1 in. (25 mm) for freight elevator capacity plates.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-244, filed 12/1/92, effective 1/1/93.]

WAC 296-95-245 Signs on freight elevators. In addition to the capacity plate or painted sign required by WAC 296-95-244, signs shall be provided or painted inside the car and shall be located in a conspicuous position and permanently and securely fastened to the car enclosure subject to the following requirements:

(1) In elevators not permitted to carry passengers, the signs shall read: "**This is not a passenger elevator, no persons other than the operator and freight handlers are permitted to ride on this elevator.**"

(2) In elevators permitted to carry employees, the signs shall read: "**No passengers except employees permitted.**"

The signs shall be durable and readily legible with 1/2 in. (13 mm) high letters.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-245, filed 12/1/92, effective 1/1/93.]

[Title 296 WAC—p. 1910]

Section 8 Driving Machines and Sheaves

WAC 296-95-250 General requirements. (1) Sheaves and drums shall be of cast iron or steel and shall have finished grooves for ropes.

(2) Set screws fastenings shall not be used in lieu of keys or pins on connections subject to torque or tension.

(3) Friction gearing or a clutch mechanism shall not be used to connect a driving-machine drum or sheave to the main driving mechanism, other than in connection with a car leveling device.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-250, filed 12/1/92, effective 1/1/93.]

WAC 296-95-255 Winding drum machines. (1) Winding drum machines shall be provided with a slack-rope device having an enclosed switch of the manually reset type which shall cause the electric power to be removed from the elevator driving machine motor and brake if the hoisting ropes become slack or broken.

(2) Winding drum machines shall be equipped with adjustable machine automatic terminal stop mechanisms set to directly open the main line circuit to the driving machine motor and brake coincident with the opening of the final terminal stopping switch. Chain, belt, or rope-driven mechanisms shall not be used.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-255, filed 12/1/92, effective 1/1/93.]

WAC 296-95-256 Indirect-drive machines. (1) Indirect-drive machines, utilizing vee belts, tooth drive belts, or chain drives, shall include not less than three belts or chains operating together in parallel as a set. Belt and chain drive sets shall be preloaded and matched for length in sets.

(2) Belt sets shall be selected on the basis of the manufacturer's rated breaking strength and a safety factor of 10. Chain and sprocket sets shall be selected on the basis of recommendations set forth in the supplementary information section of ANSI B 29.1, using a service factor of 2.0. Offset links in a chain are permitted. Chain drives and belt drives shall be guarded to protect against accidental contact and to prevent foreign objects from interfering with drives.

Sprockets in a chain drive set and also in a driven set shall be assembled into a common hub, with teeth cut in line after assembly to assure equal load distribution on all chains. Tooth sheaves for a belt drive shall be constructed in a manner to assure equal load distribution on each belt in the set.

Load determination for both the belt and chain sets shall be based on the maximum static loading on the elevator car (full load on the car and the car at rest at a position in the hoistway which creates the greatest load, including either the car or counterweight resting on its buffer).

(3) Each belt or chain in a set shall be continuously monitored by a broken belt or chain device of the manually reset type which shall function to automatically interrupt power to the machine and apply the brake in the event any belt or chain in the set breaks or becomes excessively slack. The driving machine brake shall be located on the traction sheave or winding drum assembly side of the driving machine so as to

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be fully effective in the event the entire belt set or chain set should break.

(4) If one belt or chain of a set is worn, stretched, or damaged so as to require replacement, the entire set shall be replaced. Sprockets and toothed sheaves shall also be inspected on such occasion and be replaced if noticeably worn.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-256, filed 12/1/92, effective 1/1/93.]

WAC 296-95-260 Brakes. The elevator driving machine shall be equipped with a friction brake applied by a spring or springs, and released electrically.

The brake shall be designed to have a capacity sufficient to hold the car at rest with its rated load. For passenger elevators and freight elevators permitted to carry employees, the brake shall be designed to hold the car at rest with an additional load up to twenty-five percent in excess of the rated load. (See also WAC 296-95-243 (2)(c)(iv).)

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-260, filed 12/1/92, effective 1/1/93.]

WAC 296-95-261 Driving and release of driving machine brakes. Driving machine brakes shall not be electrically released until power has been applied to the driving machine motor. All power feed lines to the brake shall be opened and the brake shall apply automatically when:

- (1) The operating device of a car switch or continuous pressure operation elevator is in the stop position;
- (2) A floor stop device functions;
- (3) Any of the electrical protective devices in WAC 296-95-272 functions.

Under conditions described in subsection (1) and (2) of this section, the application of the brake may occur on or before the completion of the slowdown and leveling operations.

The brake shall not be permanently connected across the armature or field of a direct current elevator driving machine motor.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-261, filed 12/1/92, effective 1/1/93.]

Section 9 Terminal Stopping Devices

WAC 296-95-262 Normal terminal stopping devices. Enclosed upper and lower normal terminal stopping devices shall be provided and arranged to slow down and stop the car automatically, at or near the top and bottom terminal landings. Such devices shall function independently of the operation of the normal stopping means and of the final terminal stopping device.

(1) Location. Normal stopping devices shall be located on the car, in the hoistway, or in the machine room, and shall be operated by the movement of the car.

(2) Broken rope, tape, and chain switches. Broken rope, tape, or chain switches shall be provided in connection with normal terminal stopping devices located in the machine room of traction elevators. Such switches shall be opened by a failure of the rope, tape, or chain and shall cause the electric

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power to be removed from the driving machine motor and brake.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-262, filed 12/1/92, effective 1/1/93.]

WAC 296-95-264 Final terminal stopping devices. Enclosed upper and lower final terminal electro-mechanical stopping devices shall be provided and arranged to prevent movement of the car by the normal operating devices in either direction of travel after the car has passed a terminal landing. Final terminal stopping devices shall be located as follows:

(1) Winding drum driving machines. Elevators having winding drum machines shall have stopping switches on the machines and also in the hoistway operated by the movement of the car.

(2) Traction driving machines. Elevators having traction driving machines shall have stopping switches in the hoistway operated by the movement of the car.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-264, filed 12/1/92, effective 1/1/93.]

Section 10 Operating Devices and Control Equipment

WAC 296-95-266 Types of operating devices. Rope (i.e., shipper rope) or rod operating devices, actuated directly by hand, or rope operating devices actuated by wheels, levers, or cranks shall not be used.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-266, filed 12/1/92, effective 1/1/93.]

WAC 296-95-268 Car-switch operation elevator. Handles of lever-type operating devices of car-switch operation elevators shall be so arranged that they will return to the stop position and latch there automatically when the hand of the operator is removed.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-268, filed 12/1/92, effective 1/1/93.]

WAC 296-95-269 Passenger elevator emergency stop buttons. Passenger elevator emergency stop buttons or switches shall be so installed and connected as to activate the elevator alarm when in the stop position. An optional door hold open switch may be provided if desired, but such door hold open function shall automatically cancel upon activation of a Phase I recall.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-269, filed 12/1/92, effective 1/1/93.]

WAC 296-95-270 Top-of-car operating devices. (1) Elevators with automatic or continuous-pressure operation shall have a continuous-pressure button operating switch mounted on the top of the car for the purpose of operating the car solely from the top of the car. The device shall operate the car at a speed not exceeding 150 fpm. (0.76 m/s).

(2) The means for transferring the control of the elevator to the top-of-car operating device shall be on the car top and located between the car crosshead and the side of the car nearest the hoistway entrance normally used for access to the car top.

[Title 296 WAC—p. 1911]

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-270, filed 12/1/92, effective 1/1/93.]

WAC 296-95-272 Electrical protective devices. Electrical protective devices shall be provided in accordance with the following:

(1) Slack-rope switch. Winding drum machines shall be provided with a slack-rope device equipped with a slack-rope switch of the enclosed manually reset type which shall cause the electric power to be removed from the elevator driving machine motor and brake if the suspension ropes become slack.

(2) Motor-generator running switch. Where generator-field control is used, means shall be provided to prevent the application of power to the elevator driving machine motor and brake unless the motor generator set connections are properly switched for the running condition of the elevator. It is not required that the electrical connections between the elevator driving machine motor and the generator be opened in order to remove power from the elevator motor.

(3) Compensating rope sheave switch. Compensating rope sheaves shall be provided with a compensating rope sheave switch or switches mechanically opened by the compensating rope sheave before the sheave reaches its upper or lower limit of travel to cause the electric power to be removed from the elevator driving machine motor and brake.

(4) Broken rope, tape, or chain switches used in connection with machine room normal terminal stopping switches. Broken rope, tape, or chain switches conforming to the requirements of WAC 296-95-236 shall be provided in connection with normal terminal stopping devices located in machine rooms of traction elevators. Such switches shall be opened by a failure of the rope, tape, or chain.

(5) Stop switch on top of car. A stop switch shall be provided on the top of every elevator car, which shall cause the electric power to be removed from the elevator driving machine motor and brake, and:

- (a) Be of the manually operated and closed type;
- (b) Have red operating handles or buttons;
- (c) Be conspicuously and permanently marked "stop" and shall indicate the stop and run positions;
- (d) Be positively opened mechanically (opening shall not be solely dependent on springs).

(6) Car-safety mechanism switch. A switch shall be required where a car safety is provided.

(7) Speed governor overspeed switch. A speed governor overspeed switch shall be provided when required by WAC 296-95-236.

(8) Final terminal stopping devices. Final terminal stopping devices shall be provided for every elevator.

(9) Emergency terminal speed limiting device. Where reduced stroke oil buffers are provided, emergency terminal speed limiting devices are required.

(10) Motor generator overspeed protection. Means shall be provided to cause the electric power to be removed automatically from the elevator driving machine motor and brake should a motor generator set, driven by a direct current motor, overspeed excessively.

(11) Motor field sensing means. Where direct current is supplied to an armature and shunt field of an elevator driving machine motor, a motor field current sensing means shall be

provided, which shall cause the electric power to be removed from the motor armature and brake unless current is flowing in the shunt field of the motor.

A motor field current sensing means is not required for static control elevators provided with a device to detect an overspeed condition prior to, and independent of, the operation of the governor overspeed switch. This device shall cause power to be removed from the elevator driving machine motor armature and machine brake.

(12) Buffer switches for oil buffers used with Type C car safeties. Oil level and compression switches shall be provided for all oil buffers used with Type C safeties.

(13) Hoistway door interlocks or hoistway door electric contacts. Hoistway door interlocks or hoistway door electric contacts shall be provided for all elevators.

(14) Car door or gate electric contacts. Car door or gate electric contacts shall be provided for all elevators.

(15) Normal terminal stopping devices. Normal terminal stopping devices shall be provided for every elevator.

(16) Car side emergency exit electric contact. An electric contact shall be provided on every car side emergency exit door.

(17) Electric contacts for hinged car platform sills. Hinged car platform sills, where provided, shall be equipped with electric contacts.

(18) Stop switch in elevator pit. A stop switch shall be installed in all elevator pits. It shall be located between 36 in. to 48 in. above the bottom landing floor, and accessible from outside the hoistway.

[Statutory Authority: Chapter 70.87 RCW. 95-04-005, § 296-95-272, filed 1/18/95, effective 3/1/95. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-272, filed 12/1/92, effective 1/1/93.]

WAC 296-95-274 Power supply line disconnecting means. (1) A disconnect switch or a circuit breaker shall be installed and connected into the power supply line to each elevator motor or motor generator set and controller. The power supply line shall be provided with overcurrent protection inside the machine room.

(2) The disconnect switch or circuit breaker shall be of the manually closed multipole type, and be visible from the elevator driving machine or motor generator set. When the disconnecting means is not within sight of the driving machine, the control panel, or the motor generator set, and additional manually operated switch shall be installed adjacent to the remote equipment and connected in the control circuit to prevent starting.

(3) No provision shall be made to close the disconnect switch from any other part of the building.

(4) Where there is more than one driving machine in a machine room, disconnect switches or circuit breakers shall be numbered to correspond to the number of the driving machine which they control.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-274, filed 12/1/92, effective 1/1/93.]

WAC 296-95-276 Phase reversal and failure protection. Elevators having polyphase alternating current power supply shall be provided with means to prevent the starting of the elevator motor if the phase rotation is in the wrong direction, or if there is a failure of any phase.

This protection shall be considered to be provided in the case of generator field control having alternating current motor-generator driving motors, provided a reversal of phase will not cause the elevator driving machine motor to operate in the wrong direction. Controllers on which switches are operated by polyphase torque motors provide inherent protection against phase reversal or failure.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-276, filed 12/1/92, effective 1/1/93.]

WAC 296-95-277 Grounding and overcurrent protections. Control and operating circuit requirements shall comply with Article 620-61 of the National Electrical Code. Overcurrent protection shall be maintained in accordance with Article 620-61, National Electrical Code.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-277, filed 12/1/92, effective 1/1/93.]

WAC 296-95-278 Absorption of regenerated power. When a power source is used which, in itself, is incapable of absorbing the energy generated by an overhauling load, means for absorbing sufficient energy to prevent the elevator from attaining governor tripping speed or a speed in excess of one hundred twenty-five percent of rated speed, whichever is lesser, shall be provided on the load side of each elevator power supply line disconnecting means.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-278, filed 12/1/92, effective 1/1/93.]

WAC 296-95-279 Door by-pass systems. Door by-pass systems where used shall conform to the requirements of ANSI A17.1, Rule 210.1e.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-279, filed 12/1/92, effective 1/1/93.]

**Section 11
Emergency Operation and
Signaling Devices**

WAC 296-95-280 Car emergency signaling devices (in all buildings). All elevators shall be provided with an audible signaling device, operable from a switch or button marked "alarm" which shall be located in or adjacent to each car operating panel. The signaling device shall be located inside the building and audible inside the car and outside the hoistway. One signaling device may be used for a group of elevators.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-280, filed 12/1/92, effective 1/1/93.]

**Section 12
Suspension Means and Their
Connections**

WAC 296-95-282 Suspension means. Cars shall be suspended by steel wire ropes attached to the car frame or passing around sheaves attached to the car frame. Only iron (low-carbon steel) or steel wire ropes, having the commercial classification "elevator wire rope," or wire rope specifically constructed for elevator use shall be used for the suspension of elevator cars and for the suspension of counterweights. The

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wire material for ropes shall be manufactured by the open-hearth or electric furnace process or their equivalent.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-282, filed 12/1/92, effective 1/1/93.]

WAC 296-95-283 Rope data tag. At each rope renewal a new metal data tag shall be securely attached to one of the wire rope fastenings. This data tag shall bear the following wire rope data:

- (1) The diameter in inches;
- (2) The manufacturer's rated breaking strength;
- (3) The grade of material used;
- (4) The month and year the ropes were installed;
- (5) Whether nonpreformed or preformed;
- (6) Construction classification;
- (7) Name of the person or firm who installed ropes;
- (8) Name of the manufacturer of the rope;
- (9) The number of ropes;
- (10) The date on which the rope was resocketed or other types of fastening changed.

Rope data tags shall be durable and readily legible. The height of letters and figures shall be not less than 1/16 in. (1.6 mm).

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-283, filed 12/1/92, effective 1/1/93.]

WAC 296-95-284 Factor of safety. The factor of safety of the suspension wire ropes shall be not less than shown in the table below. The factor of safety shall be based on the actual rope speed corresponding to the rated speed of the car. The factor of safety shall be calculated by the following formula:

$$f = S \text{ times } N \text{ over } W$$

where

N = number of runs of rope under load. (For 2:1 roping, twice the number of ropes used. For 3:1 roping, three times, etc.)

S = manufacturer's rated breaking strength of one rope.

W = maximum static load imposed on all car ropes with the car and its rated load at any position in the hoistway.

TABLE 3.12.3
MINIMUM FACTORS OF SAFETY FOR SUSPENSION WIRE ROPES

Rope Speed, fpm	Minimum Factor of Safety		Rope Speed, fpm	Minimum Factor of Safety	
	Passenger	Freight		Passenger	Freight
50	7.60	6.65	650	10.85	9.65
75	7.75	6.85	700	11.00	9.80
100	7.95	7.00	750	11.15	9.90
125	8.10	7.15	800	11.25	10.00
150	2.25	7.30	850	11.35	10.10
175	8.40	7.45	900	11.45	10.15
200	8.60	7.65	950	11.50	10.20
225	8.75	7.75	1000	11.55	10.30
250	8.90	7.90	1050	11.65	10.35
300	9.20	8.20	1100	11.70	10.40
350	9.50	8.45	1150	11.75	10.45
400	9.75	8.70	1200	11.80	10.50
450	10.00	8.90	1250	11.80	10.50
500	10.25	9.15	1300	11.85	10.55
550	10.45	9.30	1350	11.85	10.55
600	10.70	9.50	1400-2000	11.90	10.55

GENERAL NOTE: 1 FPM = 5.08 E -03 m/s

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-284, filed 12/1/92, effective 1/1/93.]

WAC 296-95-285 Minimum number and diameter of suspension ropes. All elevators, except freight elevators that do not carry passengers or freight handlers and have no means of operation in the car, shall conform to the following requirements:

(1) The minimum number of hoisting ropes used shall be three for traction elevators and two for drum-type elevators. Where a car counterweight is used, the number of counterweight ropes used shall be not less than two.

(2) The minimum diameter of hoisting and counterweight ropes shall be 3/8 in. (9.5 mm). Outer wires of the ropes shall be not less than 0.024 in. (0.61 mm) in diameter. The term "diameter" where used in this section shall refer to the nominal diameter as given by the rope manufacturer.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-285, filed 12/1/92, effective 1/1/93.]

WAC 296-95-287 Suspension rope equalizers. Suspension rope equalizers, where provided, shall be of the individual-compression spring type.

Equalizers of other type may be used with traction elevators provided the equalizers and their fastenings are approved by the authority having jurisdiction on the basis of adequate tensile and fatigue tests made by a qualified laboratory. Such tests shall show the ultimate strength of the equalizer and its fastenings in its several parts and assembly, which shall be not less than ten percent in excess of the strength of suspension ropes, provided that equalizers of the single-bar type, or springs in tension, shall not be used to attach suspension ropes to cars or counterweights or to dead-end hitch plates.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-287, filed 12/1/92, effective 1/1/93.]

WAC 296-95-288 Securing of suspension wire ropes to winding drums. Suspension wire ropes of winding drum machines shall have the drum ends of the ropes secured on the inside of the drum by clamps or by tapered babbitted sockets, or by other means approved by the authority having jurisdiction.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-288, filed 12/1/92, effective 1/1/93.]

WAC 296-95-289 Spare rope turns on winding drums. Suspension wire ropes of winding drum machines shall have not less than one turn of the rope on the drum when the car is resting on the fully compressed buffers.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-289, filed 12/1/92, effective 1/1/93.]

WAC 296-95-290 Suspension rope fastenings. Spliced eyes by return loop may continue in service. Suspension rope fastenings shall conform to the requirements of ANSI/ASME A17.1 Rule 212.9 when the ropes are replaced.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-290, filed 12/1/92, effective 1/1/93.]

WAC 296-95-291 Auxiliary rope fastening devices. Auxiliary rope fastening devices, designed to support cars or

counterweights if any regular rope fastenings fail, may be provided subject to approval by the authority having jurisdiction.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-291, filed 12/1/92, effective 1/1/93.]

PART III HYDRAULIC ELEVATORS

WAC 296-95-300 Scope. This part applies to all existing direct plunger and roped hydraulic elevators.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-300, filed 12/1/92, effective 1/1/93.]

Section 1 Hoistways, Hoistway Enclosures, and Related Construction

WAC 296-95-302 Hoistways, hoistway enclosures, and related construction shall conform to the requirements of Part 1.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-302, filed 12/1/92, effective 1/1/93.]

Section 2 Mechanical Equipment

WAC 296-95-304 Buffers and bumpers. Car buffers or bumpers shall be provided. Solid bumpers may be used in lieu of buffers where the rated speed is 50 fpm (0.25 m/s) or less.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-304, filed 12/1/92, effective 1/1/93.]

WAC 296-95-307 Car frames and platforms. Car frames and platforms shall conform to the requirements of WAC 296-95-206.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-307, filed 12/1/92, effective 1/1/93.]

WAC 296-95-309 Car enclosures. Car enclosures shall conform to the requirements of WAC 296-95-215.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-309, filed 12/1/92, effective 1/1/93.]

WAC 296-95-311 Capacity and loading. Capacity and loading shall conform to the requirements of WAC 296-95-240.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-311, filed 12/1/92, effective 1/1/93.]

Section 3 Driving Machines

WAC 296-95-313 Connection to driving machine. The driving member of a direct plunger driving machine shall be attached to the car frame or car platform with fastenings of sufficient strength to support that member.

The connection to the driving machine shall be capable of withstanding, without damage, any forces resulting from a plunger stop.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-313, filed 12/1/92, effective 1/1/93.]

WAC 296-95-316 Plunger stops. Plungers shall be provided with solid metal stops and/or other means to prevent the plunger from traveling beyond the limits of the cylinder. Stops shall be so designed and constructed as to stop the plunger from maximum speed in the up direction under full pressure without damage to the connection to the driving machine, plunger, plunger connection, couplings, plunger joints, cylinder, cylinder connecting couplings or any other parts of the hydraulic system. For rated speeds exceeding 100 fpm (0.51 m/s) where a solid metal stop is provided, means other than the normal terminal stopping device (i.e., emergency terminal speed limiting device) shall be provided to retard the car to 100 fpm (0.51 m/s) with a retardation not greater than gravity, before striking the stop.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-316, filed 12/1/92, effective 1/1/93.]

Section 4 Valves, Supply Piping, and Fittings

WAC 296-95-318 Pump relief valve. (1) Pump relief valve required. Each pump or group of pumps shall be equipped with a relief valve conforming to the following requirements, except as covered by subsection (2) of this section:

(a) Type and location. The relief valve shall be located between the pump and the check valve and shall be of such a type and so installed in the by-pass connection that the valve cannot be shut off from the hydraulic system.

(b) Setting. The relief valve shall be preset to open at a pressure not greater than one hundred twenty-five percent of working pressure.

(c) Size. The size of the relief valve and by-pass shall be sufficient to pass the maximum rated capacity of the pump without raising the pressure more than twenty percent above that at which the valve opens. Two or more relief valves may be used to obtain the required capacity.

(d) Sealing. Relief valves having exposed pressure adjustments, if used, shall have their means of adjustment sealed after being set to the correct pressure.

(2) Pump relief valve not required. No relief valve is required for centrifugal pumps driven by induction motors, provided the shutoff, or maximum pressure which the pump can develop, is not greater than one hundred thirty-five percent of the working pressure at the pump.

[Statutory Authority: Chapter 70.87 RCW. 95-04-005, § 296-95-318, filed 1/18/95, effective 3/1/95. Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-318, filed 12/1/92, effective 1/1/93.]

WAC 296-95-321 Check valve. A check valve shall be provided and shall be so installed that it will hold the elevator car with rated load at any point when the pump stops or the maintained pressure drops below the minimum operating pressure.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-321, filed 12/1/92, effective 1/1/93.]

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WAC 296-95-322 Supply piping and fittings. Supply piping and fittings shall be in sound condition and secured in place.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-322, filed 12/1/92, effective 1/1/93.]

WAC 296-95-323 Flexible hydraulic connections. When flexible hydraulic connections are replaced the requirements of ANSI A17.1, Rule 303.1d shall be complied with in all respects. Where flexible connections pass through walls the replacement shall be made with steel piping.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-323, filed 12/1/92, effective 1/1/93.]

Section 5 Tanks

WAC 296-95-324 General requirements. (1) Capacity. All tanks shall be of sufficient capacity to provide for an adequate liquid reserve to prevent the entrance of air or other gas into the system.

(2) Minimal liquid level indicator. The permissible minimum liquid level shall be clearly indicated.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-324, filed 12/1/92, effective 1/1/93.]

WAC 296-95-325 Pressure tanks. (1) Vacuum relief valves. Tanks which may be subjected to vacuum sufficient to cause collapse shall be provided with one or more vacuum relief valves with openings of sufficient size to prevent collapse of the tank.

(2) Gage glasses. Tanks shall be provided with one or more gage glasses attached directly to the tank and equipped to shut off the liquid automatically in case of failure of the glass. The gage glass or glasses shall be so located as to indicate any level of the liquid between permissible minimum and maximum levels, and shall be equipped with a manual cock at the bottom of the lowest glass.

(3) Pressure gage. Tanks shall be provided with a pressure gage which will indicate the pressure correctly to not less than 1-1/2 times the pressure setting of the relief valve. The gage shall be connected to the tank or water column by pipe and fittings with a stop cock in such a manner that it cannot be shut off from the tank except by a stop cock. The stop cock shall have a "T" or level handle set in line with the direction of flow through the valve when open.

(4) Inspector's gage connection. Tanks shall be provided with 1/4 in. (6.3 mm) pipe size valve connection for attaching an inspector's pressure gage while the tank is in service.

(5) Liquid level detector. Tanks shall be provided with a means to render the elevator inoperative if for any reason the liquid level in the tank falls below the permissible minimum.

(6) Handholes and manholes. Tanks shall be provided with means for internal inspection.

(7) Piping and fittings for gages. Piping and fittings for gage glasses, relief valves, and pressure gages shall be of a material that will not be corroded by the liquid used in the tank.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-325, filed 12/1/92, effective 1/1/93.]

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Section 6 Terminal Stopping Devices

WAC 296-95-326 Terminal stopping devices shall conform to the requirements of WAC 296-95-262.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-326, filed 12/1/92, effective 1/1/93.]

Section 7 Operating Devices and Control Equipment

WAC 296-95-328 Operating devices. Operating devices shall conform to the requirements of WAC 296-95-266 and 296-95-268.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-328, filed 12/1/92, effective 1/1/93.]

WAC 296-95-330 Top-of-car operating devices. Top-of-car operating devices shall be provided and shall conform to the requirements of WAC 296-95-270, except for uncounterweighted elevators having a rise of not more than 15 ft. (4.57 m).

The bottom normal terminal stopping device may be made ineffective while the elevator is under the control of the top-of-car operating device.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-330, filed 12/1/92, effective 1/1/93.]

WAC 296-95-332 Anticreep leveling devices. Each elevator shall be provided with an anticreep leveling device conforming to the following:

- (1) It shall maintain the car within 3 in. (87 mm) of the landing irrespective of the position of the hoistway door;
- (2) For electrohydraulic elevators, it shall be required to operate the car only in the up direction;
- (3) For maintained pressure hydraulic elevators, it shall be required to operate the car in both directions;
- (4) Its operation may depend on the availability of the electric power supply provided that:

(a) The power supply line disconnecting means required by WAC 296-95-274 is kept in the closed position at all times except during maintenance, repairs, and inspections; and

(b) The electrical protective devices required by WAC 296-95-334(2) shall not cause the power to be removed from the device.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-332, filed 12/1/92, effective 1/1/93.]

WAC 296-95-334 Electrical protective devices. Electrical protective devices, if provided, shall conform with the requirements of WAC 296-95-272 and operate as follows:

(1) The following devices shall prevent operation of the elevator by the normal operating device and also the movement of the car in response to the anticreep leveling device:

- (a) Stop switches in the pit;
- (b) Stop switches on top of the car;
- (c) Car side emergency exit door electric contacts, where such doors are provided.

(2) The following devices shall prevent the operation of the elevator by the normal operating device, but the anticreep

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leveling device required by WAC 296-95-332 shall remain operative:

- (a) Emergency stop switches in the car;
- (b) Broken rope, tape, or chain switches on normal terminal stopping devices when such devices are located in the machine room or overhead space;
- (c) Hoistway door interlocks or hoistway door electric contacts;
- (d) Car door or gate electric contacts;
- (e) Hinged car platform sill electric contacts.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-334, filed 12/1/92, effective 1/1/93.]

WAC 296-95-336 Power supply line disconnecting means. Power supply line disconnecting means shall conform to the requirements of WAC 296-95-274.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-336, filed 12/1/92, effective 1/1/93.]

WAC 296-95-338 Devices for making hoistway door interlocks or electric contacts, or car door or gate electric contacts inoperative. The installation shall conform to the requirements of WAC 296-95-221(5).

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-338, filed 12/1/92, effective 1/1/93.]

WAC 296-95-340 Control and operating circuit requirements. Control and operating circuits shall conform to the requirements of WAC 296-95-222.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-340, filed 12/1/92, effective 1/1/93.]

WAC 296-95-342 Emergency operation and signaling devices. Emergency operation and signaling devices shall conform to the requirements of WAC 296-95-280.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-342, filed 12/1/92, effective 1/1/93.]

Section 8 Additional Requirements for Counterweighted Hydraulic Elevators

WAC 296-95-344 Additional requirements for counterweighted hydraulic elevators. Counterweighted hydraulic elevators shall be roped so that the counterweight shall not strike the overhead when the car is resting on its fully compressed buffer. Counterweighted hydraulic elevators shall conform to the requirements of WAC 296-95-205 where applicable.

Where counterweights are provided, counterweight buffers shall be provided.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-344, filed 12/1/92, effective 1/1/93.]

PART IV ESCALATORS

WAC 296-95-400 Scope. This part is a minimum standard for all escalators used to transport passengers.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-400, filed 12/1/92, effective 1/1/93.]

Section 1 Construction

WAC 296-95-405 Balustrades. The balustrade shall be totally closed except where the handrail enters the newel base. Gaps between interior panels are permitted provided that they are not wider than 3/16 in. (4.8 mm) and the edges are rounded or beveled.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-405, filed 12/1/92, effective 1/1/93.]

WAC 296-95-408 Clearance between skirt and step. The clearance on each side of the steps between the step tread and the adjacent skirt panel shall be not more than 3/16 in. (4.8 mm).

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-408, filed 12/1/92, effective 1/1/93.]

WAC 296-95-410 Guards at ceiling or soffit intersections. (1) Guard required. A solid guard shall be provided in the intersection of the angle of the outside balustrade (deck board) and the ceiling or soffit, except as indicated in subsection (2) of this section. The vertical edge of the guard shall be a minimum of 8 in. (203 mm). The escalator side of the vertical face of the guard shall be flush with the face of the well-way.

The exposed edge of the guard shall be rounded and have a minimum width of 1/4 in. (6.4 mm).

(2) Guard not required. Guards are not required under the following conditions:

(a) On high decks where the clearance of the outside edge of the deck and the ceiling or soffit is more than 12 in. (305 mm) or where the projected intersection of the outside deck and the ceiling or soffit is more than 24 in. (610 mm) from the centerline of the handrail;

(b) On low decks where the centerline of the handrail is more than 14 in. (356 mm) from the ceiling or soffit.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-410, filed 12/1/92, effective 1/1/93.]

WAC 296-95-412 Antislid device. On high deck balustrades, antislid devices shall be provided on decks or combination of decks when the outer edge of the deck is greater than 12 in. (305 mm) from the centerline of the handrail or on adjacent escalators when the distance between centerline of the handrails is greater than 16 in. (406 mm).

These devices shall consist of raised objects fastened to the decks, not closer than 4 in. (102 mm) to the handrail and spaced not greater than 6 ft. (1.83 m) apart. The height shall be not less than 3/4 in. (19 mm). There shall be no sharp corners or edges.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-412, filed 12/1/92, effective 1/1/93.]

WAC 296-95-414 Handrails. Each escalator shall be provided with a handrail moving in the same direction and at substantially the same speed as the steps.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-414, filed 12/1/92, effective 1/1/93.]

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WAC 296-95-416 Handrail guards. Hand or finger guards shall be provided at the point where the handrail enters the balustrade.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-416, filed 12/1/92, effective 1/1/93.]

WAC 296-95-418 Slotting of step risers. Escalators having smooth curved surface risers shall have either:

(1) Steps having cleated risers provided with vertical cleats which mesh with slots on the adjacent step tread as the steps make the transition from the incline to the horizontal; or

(2) Means to cause the opening of the power circuits to the escalator driving machine motor and brake should a step be displaced against the upthrust track at the upper and lower curves in the passenger carrying line of the track system.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-418, filed 12/1/92, effective 1/1/93.]

WAC 296-95-420 Slotting of step treads. The tread surface of each step shall be slotted in a direction parallel to the travel of the steps.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-420, filed 12/1/92, effective 1/1/93.]

WAC 296-95-422 Combplates. There shall be a combplate at the entrance and at the exit of every escalator. The combplate teeth shall be meshed with and set into the slots in the tread surface so that the points of the teeth are always below the upper surface of the treads.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-422, filed 12/1/92, effective 1/1/93.]

Section 2 Brakes

WAC 296-95-424 General requirements. Escalators shall be provided with a brake capable of stopping the up or down traveling escalator with any load up to brake rated load. The brake shall be mechanically or magnetically applied. If the brake is magnetically applied, a ceramic permanent magnet shall be used.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-424, filed 12/1/92, effective 1/1/93.]

WAC 296-95-427 Main drive shaft brake. If the escalator brake is separated from the main drive shaft by a chain used to connect the driving machine to the main drive shaft, a mechanically or magnetically applied brake capable of stopping a down running escalator with brake rated load shall be provided on the main drive shaft. If the brake is magnetically applied, a ceramic permanent magnet shall be used.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-427, filed 12/1/92, effective 1/1/93.]

Section 3 Operating and Safety Devices

WAC 296-95-429 Starting switches. Starting switches shall be of the key-operated type and shall be located so that the escalator steps are within sight.

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[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-429, filed 12/1/92, effective 1/1/93.]

WAC 296-95-431 Emergency stop buttons. There shall be a red stop button accessibly located at the top and bottom landings of each escalator. The operation of either one of these buttons shall cause the interruption of power to the escalator. It shall be impossible to start an escalator by means of these buttons. These buttons shall be marked "escalator stop button."

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-431, filed 12/1/92, effective 1/1/93.]

WAC 296-95-432 Speed governor. (1) Speed governor required. A speed governor shall be provided, except as specified in subsection (2) of this section. Its operation shall cause the interruption of power to the driving machine if the speed of the steps exceeds a predetermined value, which shall be not more than forty percent above the rated speed.

(2) Speed governor not required. The speed governor is not required where an alternating current squirrel cage induction motor is used and the motor is directly connected to the driving machine.

Note: The governor may be omitted in such case even though a chain is used to connect the sprocket on the driving machine to the sprocket on the main drive shaft.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-432, filed 12/1/92, effective 1/1/93.]

WAC 296-95-434 Broken step-chain device. A broken step-chain device shall be provided to cause the interruption of power to the driving machine if a step chain breaks, and, where no automatic chain tension device is provided, if excessive sag occurs in either step chain.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-434, filed 12/1/92, effective 1/1/93.]

WAC 296-95-436 Application of brake. The brake shall automatically stop the escalator when any of the safety devices function.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-436, filed 12/1/92, effective 1/1/93.]

WAC 296-95-438 Broken drive-chain device. When the driving machine is connected to the main drive shaft by a chain, a device shall be provided which shall cause the application of the brake on the main drive shaft and also stop the drive machine if the drive chain parts.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-438, filed 12/1/92, effective 1/1/93.]

WAC 296-95-440 Skirt obstruction device. Means shall be provided to stop the escalator if an object becomes accidentally caught between the step and the skirt as the step approaches the upper or lower combplate. The device shall be located so that the escalator will stop before that object reaches the combplate.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-440, filed 12/1/92, effective 1/1/93.]

WAC 296-95-442 Rolling shutter device. Rolling shutters, if used, shall be provided with a device which shall be

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actuated as the shutters begin to close to cause the opening of the power circuit to the escalator driving machine motor and brake.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-442, filed 12/1/92, effective 1/1/93.]

WAC 296-95-444 Reversal stop device. Means shall be provided to cause the opening of the power circuit to the driving machine motor and brake in case of accidental reversal of travel while the escalator is operating in the ascending direction.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-444, filed 12/1/92, effective 1/1/93.]

WAC 296-95-446 Tandem operation. Tandem operation escalators shall be electrically interlocked where traffic flow is such that bunching will occur if the escalator is carrying passengers away from the intermediate landing stops.

The electrical interlocks shall stop the escalator carrying passengers into the common intermediate landing if the escalator carrying passengers away from the landing stops. These escalators shall also be electrically interlocked to assure that they run in the same direction.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-446, filed 12/1/92, effective 1/1/93.]

WAC 296-95-448 Caution signs. A caution sign shall be located at the top and bottom landings of each escalator, readily visible to the boarding passengers. The sign shall include the following words:

- (1) Caution;
- (2) Passenger only;
- (3) Hold handrail;
- (4) Attend children;
- (5) Avoid sides.

The sign shall be of the standard design recognized by the elevator industry.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-448, filed 12/1/92, effective 1/1/93.]

Section 4 Lighting of Step Treads

WAC 296-95-450 Lighting of step treads. Step treads shall be illuminated throughout their run. The light intensity on the treads shall be in accordance with local codes and ordinances for stairways.

Note: It is desirable that the illumination be of uniform intensity and that it should not contrast significantly with that of the surrounding area.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-450, filed 12/1/92, effective 1/1/93.]

**PART V
DUMBWAITERS, HAND-POWERED
DUMBWAITERS,
AND HAND-POWERED ELEVATORS**

WAC 296-95-500 Scope. This part is a minimum standard for all existing electric and hand-powered dumbwaiters and hand-powered elevators.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-500, filed 12/1/92, effective 1/1/93.]

WAC 296-95-510 Electric and electro-hydraulic dumbwaiters. (1) Dumbwaiter cars may be constructed of metal or wood and shall be in compliance with local ordinances as to fire resistivity providing it is constructed to carry its rated load without distortion. The dumbwaiter car must be fully enclosed except for the landing sides. The car floor shall not exceed 9 square feet in area and the total inside height shall not exceed 4 feet and the maximum capacity shall not exceed five hundred pounds. The fire resistance rating for the hoistway and hoistway doors shall conform with the local area fire ordinances where required. Hoistway doors shall be installed at each hoistway opening. Hoistway doors shall be equipped with electric contacts and mechanical locks.

(2) Electrically operated machines shall be equipped with brakes that are electrically released and applied automatically by springs in conformity with the requirements set forth in WAC 296-95-260.

(3) Dumbwaiters equipped with winding drum machines having a travel of more than 30 feet and a rated load of more than one hundred pounds, shall be equipped with a slack rope switch which will automatically remove the power from the motor and brake when the hoisting ropes become slack.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-510, filed 12/1/92, effective 1/1/93.]

WAC 296-95-540 Hand-power elevators and dumbwaiters. (1) Cars of hand-power elevators and dumbwaiters shall be enclosed on all sides not used for entrance. Elevator cars upon which an operator is permitted to ride shall have not more than one compartment.

(2) Hand elevators having a travel of more than 15 feet shall be provided with a car safety, capable of stopping and sustaining the car and rated load. The car safety device is not required to be operated by a speed governor, and may be of the instantaneous type operated as a result of the breaking and slackening of the suspension members.

(3) Hoistway doors for hand-powered elevators shall be so designed that they will ensure protection at each landing.

(4) Doors for hand-powered dumbwaiters shall be so designed that they will ensure protection at all landings.

(5) Every hoistway door, gate, or entrance of hand elevators and hand dumbwaiters shall have conspicuously displayed on the landing side in letters not less than 2 inches high, the words: "**Danger—Elevator—Keep closed**" or "**Danger—Dumbwaiter—Keep closed**."

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-540, filed 12/1/92, effective 1/1/93.]

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**PART VI
ALTERATIONS, REPAIRS, AND MAINTENANCE**

WAC 296-95-600 Scope. This part applies to periodic inspections, tests, alterations, and maintenance.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-600, filed 12/1/92, effective 1/1/93.]

WAC 296-95-610 Routine periodic inspections and tests. The owner or his or her duly appointed agent shall cause periodic tests to be made by a person qualified to perform such service, and a report indicating the date of inspection with all pertinent data included, shall be sent to the department of labor and industries, elevator section. The inspections and tests shall be in compliance with ANSI A17.1, Part X rules as follows: Section 1000, Rule 1000.1, Rule 1000.2, Rule 1000.3; Section 1001, Rule 1001.1, Rule 1001.2; Section 1002, Rule 1002.1, Rule 1002.2, Rule 1002.3; Section 1004, Rule 1004.2; Section 1005, Rule 1005.1, Rule 1005.2, Rule 1005.3, Rule 1005.4; Section 1007, Rule 1007.2; Section 1008, Rule 1008.1, Rule 1008.2; Section 1010, Rule 1010.1, Rule 1010.2, Rule 1010.3, Rule 1010.4, Rule 1010.5, Rule 1010.6, Rule 1010.7.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-610, filed 12/1/92, effective 1/1/93.]

WAC 296-95-620 Alterations, repairs, and maintenance. The owner or his or her duly appointed agent shall be responsible for the safe operation, proper maintenance, and alteration of a conveyance and shall be in compliance with ANSI A17.1, Part XII.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-620, filed 12/1/92, effective 1/1/93.]

WAC 296-95-630 Anchorage after seismic activity. Any elevator equipment, hydraulic or cable type, that is displaced by result of seismic activity shall be anchored to conform with current standards, when repaired or reanchored to the building.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-630, filed 12/1/92, effective 1/1/93.]

**PART VII
LIFTS FOR PHYSICALLY HANDICAPPED**

WAC 296-95-700 Scope. Rules governing lifting devices for physically handicapped people.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-700, filed 12/1/92, effective 1/1/93.]

WAC 296-95-710 Lifts for physically handicapped. Inclined stairway chairlifts and vertical wheelchair lifts installed only for use by persons with disabilities in locations other than in or at a private residence shall be provided with a standard electric switch Chicago lock with key #2252. This section is in addition to ANSI A17.1, Part XX, and Washington state rules and regulations barrier-free design, and it shall apply to lifts for the physically handicapped as described herein with installation permits issued by the department of labor and industries on or after the effective date of these rules. All existing installations as described herein shall be

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provided with this same lock and key within one year of the effective date of these rules.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-710, filed 12/1/92, effective 1/1/93.]

**PART VIII
SIDEWALK ELEVATORS**

WAC 296-95-800 Scope. This part is a minimum standard for all power sidewalk elevators.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-800, filed 12/1/92, effective 1/1/93.]

WAC 296-95-810 Sidewalk elevators. Electrically operated sidewalk elevators shall be in conformity with the following requirements:

Where the top opening is located in the sidewalk or other area exterior to the building, all electrical equipment on the car or in the hoistway shall be weatherproof. The operation of power sidewalk elevators through openings in the sidewalk, or through openings in other exterior areas which are protected by hinged doors or vertically lifting covers, shall conform to the following:

(1) The elevator shall be operated in both the up and down directions through the opening, only from the sidewalk or other exterior area. The operation shall be by means of:

(a) Key-operated continuous pressure type, up and down switches; or

(b) Continuous pressure type up and down operating buttons on the free end of a detachable, flexible cord five feet or less in length.

(c) Continuous pressure type up and down operating buttons may be installed on the elevator car providing the control is so designed that the buttons will not function unless the sidewalk doors are locked in the open position and that a safety screen that will open and close with the car is installed.

(2) Key-operated switches shall be of continuous pressure spring-return type, with the key removable only when the switch is in the off position.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-810, filed 12/1/92, effective 1/1/93.]

**Chapter 296-99 WAC
SAFETY STANDARDS FOR GRAIN HANDLING FACILITIES**

WAC	
296-99-010	What safety hazards does this chapter require the employer to control?
296-99-015	What grain-handling operations does this chapter cover?
296-99-020	What definitions apply to this chapter?
296-99-025	What are the requirements for an emergency action plan?
296-99-030	What training must an employer provide for employees?
296-99-035	When must an employer issue a hot work permit?
296-99-040	What practices must an employer follow for entry into grain storage structures?
296-99-045	What information must an employer provide to contractors?
296-99-050	What elements must an employer include in the house-keeping program?
296-99-055	What is the maximum allowable grate opening size?
296-99-060	How must filter collectors be installed?
296-99-065	What preventive maintenance program must an employer implement?

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296-99-070	How must grain stream processing equipment be equipped?
296-99-075	How many means of emergency escape must an employer provide?
296-99-080	How must continuous-flow bulk raw grain dryers be equipped and installed?
296-99-085	What special requirements apply to inside bucket elevators?
296-99-090	Reserved.
296-99-093	Reserved.
296-99-095	Reserved.

WAC 296-99-010 What safety hazards does this chapter require the employer to control? This chapter directs the employer to control dust fires, explosions and other safety hazards in grain handling facilities including the waterfront dock areas at marine terminals (chapter 296-56 WAC will not apply).

All provisions from chapters 296-24 and 296-62 WAC also apply. If rules in either of these chapters conflict with rules in chapter 296-99 WAC, chapter 296-99 WAC will prevail.

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-010, filed 11/3/97, effective 1/1/98; 88-23-054 (Order 88-25), § 296-99-010, filed 11/14/88.]

WAC 296-99-015 What grain-handling operations does this chapter cover? (1) WAC 296-99-010 through 296-99-070 apply to:

- Dry grinding operations of soycake;
- Dry corn mills;
- Dust pelletizing plants;
- Feed mills;
- Flour mills;
- Flat storage structures;
- Grain elevators;
- Rice mills; and
- Soybean flaking operations.

(2) WAC 296-99-075, 296-99-080, and 296-99-085 apply only to grain elevators.

(3) Chapter 296-99 WAC does not apply to alfalfa storage or processing operations if they do not use grain products.

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-015, filed 11/3/97, effective 1/1/98; 90-03-029 (Order 89-20), § 296-99-015, filed 11/1/90, effective 2/26/90; 88-23-054 (Order 88-25), § 296-99-015, filed 11/14/88.]

WAC 296-99-020 What definitions apply to this chapter? "Choked leg" means excess material buildup that stops the movement of grain and of the bucket elevator. A bucket elevator is not considered choked if it moves and the boot and discharge are clear.

"Flat storage structure" means a grain storage structure that:

- Can not empty by gravity alone;
- Can be entered through an opening at ground level; and
- Must be entered to remove leftover grain.

"Fugitive grain dust" means combustible grain dust particles, accumulated inside storage structures, that are small enough to pass through a U.S. Standard 40 mesh sieve (425 microns or less).

provided with this same lock and key within one year of the effective date of these rules.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-710, filed 12/1/92, effective 1/1/93.]

**PART VIII
SIDEWALK ELEVATORS**

WAC 296-95-800 Scope. This part is a minimum standard for all power sidewalk elevators.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-800, filed 12/1/92, effective 1/1/93.]

WAC 296-95-810 Sidewalk elevators. Electrically operated sidewalk elevators shall be in conformity with the following requirements:

Where the top opening is located in the sidewalk or other area exterior to the building, all electrical equipment on the car or in the hoistway shall be weatherproof. The operation of power sidewalk elevators through openings in the sidewalk, or through openings in other exterior areas which are protected by hinged doors or vertically lifting covers, shall conform to the following:

(1) The elevator shall be operated in both the up and down directions through the opening, only from the sidewalk or other exterior area. The operation shall be by means of:

(a) Key-operated continuous pressure type, up and down switches; or

(b) Continuous pressure type up and down operating buttons on the free end of a detachable, flexible cord five feet or less in length.

(c) Continuous pressure type up and down operating buttons may be installed on the elevator car providing the control is so designed that the buttons will not function unless the sidewalk doors are locked in the open position and that a safety screen that will open and close with the car is installed.

(2) Key-operated switches shall be of continuous pressure spring-return type, with the key removable only when the switch is in the off position.

[Statutory Authority: Chapter 70.87 RCW and RCW 70.87.030. 92-24-065, § 296-95-810, filed 12/1/92, effective 1/1/93.]

**Chapter 296-99 WAC
SAFETY STANDARDS FOR GRAIN HANDLING FACILITIES**

WAC	
296-99-010	What safety hazards does this chapter require the employer to control?
296-99-015	What grain-handling operations does this chapter cover?
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296-99-025	What are the requirements for an emergency action plan?
296-99-030	What training must an employer provide for employees?
296-99-035	When must an employer issue a hot work permit?
296-99-040	What practices must an employer follow for entry into grain storage structures?
296-99-045	What information must an employer provide to contractors?
296-99-050	What elements must an employer include in the house-keeping program?
296-99-055	What is the maximum allowable grate opening size?
296-99-060	How must filter collectors be installed?
296-99-065	What preventive maintenance program must an employer implement?

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296-99-070	How must grain stream processing equipment be equipped?
296-99-075	How many means of emergency escape must an employer provide?
296-99-080	How must continuous-flow bulk raw grain dryers be equipped and installed?
296-99-085	What special requirements apply to inside bucket elevators?
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- Flat storage structures;
- Grain elevators;
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- Soybean flaking operations.

(2) WAC 296-99-075, 296-99-080, and 296-99-085 apply only to grain elevators.

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- Can not empty by gravity alone;
- Can be entered through an opening at ground level; and
- Must be entered to remove leftover grain.

"Fugitive grain dust" means combustible grain dust particles, accumulated inside storage structures, that are small enough to pass through a U.S. Standard 40 mesh sieve (425 microns or less).

"Grain" means raw and processed grain of cereal grass seeds and grain products handled in facilities within the scope of WAC 296-99-015(1).

"Grain elevator" means a facility in which bulk raw grains are stored by means of elevating machinery for later shipment.

"Hot work" means work that involves electric or gas welding, cutting, brazing or similar heat-producing tasks that could be a source of ignition.

"Inside bucket elevator" means a bucket elevator with the boot and more than twenty percent of the total leg height (above grade or ground level) inside a grain elevator structure. Bucket elevators used inside of rail or truck dump sheds are not considered inside bucket elevators.

"Lagging" means a covering on drive pulleys used to increase the driving friction between the pulley and the belt.

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-020, filed 11/3/97, effective 1/1/98; 88-23-054 (Order 88-25), § 296-99-020, filed 11/14/88.]

WAC 296-99-025 What are the requirements for an emergency action plan? The employer must develop and implement an emergency action plan that meets the requirements of WAC 296-24-567.

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-025, filed 11/3/97, effective 1/1/98; 88-23-054 (Order 88-25), § 296-99-025, filed 11/14/88.]

WAC 296-99-030 What training must an employer provide for employees? (1) The employer must train employees:

(a) Annually; and

(b) Whenever a new job assignment exposes an employee to a new hazard.

(2) The employer must ensure that employees are trained in the following:

(a) General safety precautions against fires and explosions, including how to recognize and prevent the hazards of excess dust accumulation and ignition sources.

(b) Specific procedures and safety practices for job tasks including, but not limited to:

- Cleaning grinding equipment;
- Clearing choked legs;
- Housekeeping;
- Hot work; and
- Preventive maintenance.

(3) The employer must provide additional training for employees who are assigned special tasks, including but not limited to:

(a) Procedures for grain storage entry according to WAC 296-62-145, confined space entry, and how to:

- Control hazardous energy (lockout/tagout) according to WAC 296-24-110;
- Avoid getting buried by moving grain (engulfment);
- Avoid falling from heights; and
- Prevent mechanical hazards.

(b) How to handle flammable or toxic substances.

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-030, filed 11/3/97, effective 1/1/98; 88-23-054 (Order 88-25), § 296-99-030, filed 11/14/88.]

(1999 Ed.)

WAC 296-99-035 When must an employer issue a hot work permit? (1) Before allowing an employee to start any hot work, the employer must:

(a) Issue to the employee a permit that states that all safety precautions required by WAC 296-24-695 are in place; and

(b) Keep the permit on file until the hot work is complete.

(2) The employer may allow an employee to perform hot work without a permit if:

(a) The employer's representative personally monitors the hot work to prevent employee exposure to injury from either fire or explosion during the entire operation; or

(b) The hot work is done in welding shops authorized by the employer; or

(c) The hot work is done in hot work areas authorized by the employer which are located outside of the grain handling structure.

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-035, filed 11/3/97, effective 1/1/98; 88-23-054 (Order 88-25), § 296-99-035, filed 11/14/88.]

WAC 296-99-040 What practices must an employer follow for entry into grain storage structures? This section applies to employee entry into all grain storage structures.

(1) The employer must ensure that the practice of walking down grain is prohibited. "Walking down grain" means an employee walks on grain to make it flow within or out from a grain storage structure, or an employee is on moving grain.

(2) The employer must ensure that during the entry and occupation of a storage structure the employee uses:

- A body harness with a lifeline; or
- A boatswain's chair that meets the requirements of Part J-1 of chapter 296-24 WAC whenever:

(a) The employee is exposed to a fall hazard such as when entering from the top or above the level of the stored grain; or

(b) The employee is exposed to an engulfment hazard such as when entering at the level of the stored grain, or while walking or standing on the grain. The lifeline must be rigged so that its position and length will prevent the employee from sinking below waist level.

(3) The employer must ensure that during the occupation of storage structures, including walking or standing on grain, employees are protected from hazards related to:

- Mechanical;
- Electrical;
- Hydraulic; and
- Pneumatic equipment.

By using safeguards, lockout-tagout, or other equally effective means. All provisions for the control of hazardous energy (lockout/tagout) from WAC 296-24-110 apply to this chapter.

(4) The employer must ensure that employees are prohibited from entering any storage structure where a build-up of grain overhead (bridging) or on the sides could fall and bury them.

(5) The employer must ensure, as minimum precautions, that employee entry and occupation of all grain storage structures including flat storage structures is done according to all

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applicable requirements of WAC 296-62-145, confined space, when the storage structure:

- Has limited or restricted means of entry and exit; and
- Is not designed for continuous employee occupancy.

(6) The employer may allow an employee to perform confined space entry work in grain storage structures without a permit if the employer's representative personally monitors the work to prevent employee exposure to illness or injury from atmospheric hazards during the entire operation.

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-040, filed 11/3/97, effective 1/1/98; 88-23-054 (Order 88-25), § 296-99-040, filed 11/14/88.]

WAC 296-99-045 What information must an employer provide to contractors? (1) The employer must inform contractors working at the grain handling facility of:

- (a) General safety rules; and
- (b) Specific fire and explosion hazards related to the contractor's work and work area.

(2) The employer must explain the emergency action plan to each contractor.

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-045, filed 11/3/97, effective 1/1/98; 88-23-054 (Order 88-25), § 296-99-045, filed 11/14/88.]

WAC 296-99-050 What elements must an employer include in the housekeeping program? (1) The employer must develop and enforce a written housekeeping program that:

- (a) Establishes frequency and methods for reducing and cleaning up hazardous accumulations of fugitive grain dust;
- (b) Identifies priority areas for clean up of hazardous accumulations of fugitive grain dust, including floor areas:
 - Within thirty-five feet (10.7 m) of inside bucket elevators;
 - Of enclosed grinding equipment; and
 - Of enclosed grain dryers located inside the facility; and

(c) Requires that fugitive grain dust is cleaned up immediately whenever accumulations exceed one-eighth inch (.32 cm) at priority housekeeping areas, or provide protection against fire and explosion that is equal to the required clean up.

(2) The employer must prohibit the use of compressed air to blow dust from ledges, walls, and other areas unless all machinery that provides an ignition source in the area is shut down, and all other known potential ignition sources in the area are removed or controlled.

(3) The employer must also ensure that the housekeeping program addresses procedures for removing grain and product spills from work areas. Spills are not considered fugitive grain dust accumulations.

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-050, filed 11/3/97, effective 1/1/98; 91-11-070 (Order 91-01), § 296-99-050, filed 5/20/91, effective 6/20/91; 90-03-029 (Order 89-20), § 296-99-050, filed 1/11/90, effective 2/26/90; 88-23-054 (Order 88-25), § 296-99-050, filed 11/14/88.]

WAC 296-99-055 What is the maximum allowable grate opening size? The employer must ensure that receiving-pit feed openings, such as truck or railcar receiving-pits,

are covered by grates with maximum openings of two and one-half inches (6.35 cm).

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-055, filed 11/3/97, effective 1/1/98; 88-23-054 (Order 88-25), § 296-99-055, filed 11/14/88.]

WAC 296-99-060 How must filter collectors be installed? (1) The employer must ensure that, on a pneumatic dust collection system, each fabric dust filter collector has a monitoring device that will show a pressure drop across the surface of its filter.

(2) The employer must ensure that each filter collector installed after March 30, 1988, is:

- (a) Located outside the facility; or
- (b) When located inside the facility, protected by an explosion suppression system; or
- (c) Isolated by a structure with at least a one hour fire-resistance rating:

- Next to an exterior wall;
- Vented to the outside; and
- The vent and ductwork must resist rupture from intense heat.

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-060, filed 11/3/97, effective 1/1/98; 88-23-054 (Order 88-25), § 296-99-060, filed 11/14/88.]

WAC 296-99-065 What preventive maintenance program must an employer implement? (1) The employer must implement a written program that covers the requirements of WAC 296-24-110, The control of hazardous energy (lockout/tagout).

(2) The employer must implement preventive maintenance procedures that include the following:

(a) Conducting regularly scheduled inspections for specified machinery.

(b) Preparing written inspection reports kept on file that include:

- The date of each inspection;
- The name of the inspector; and
- The serial number, or other identification of the machinery as described next in (c) of this subsection.

(c) Conducting regularly scheduled inspections and completing immediate repairs of the mechanical equipment and safety controls of the following machinery:

- Grain dryers;
- Grain stream processing equipment;
- Dust collection systems including their filter collectors that malfunction or operate below designed efficiency;
- Overheated bearings; and
- Slipping or misaligned belt drives for inside bucket elevators.

When immediate repairs are not feasible, then the affected machine must be taken out of service.

(d) Performing lubrication and other maintenance according to manufacturers' recommendations or more often when needed, such as when operating records indicate that a more stringent schedule is necessary.

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-065, filed 11/3/97, effective 1/1/98; 88-23-054 (Order 88-25), § 296-99-065, filed 11/14/88.]

WAC 296-99-070 How must grain stream processing equipment be equipped? The employer must ensure that the following grain stream processing equipment has an effective means of removing ferrous material from the incoming grain:

- Hammer mills;
- Grinders; and
- Pulverizers.

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-070, filed 11/3/97, effective 1/1/98; 88-23-054 (Order 88-25), § 296-99-070, filed 11/14/88.]

WAC 296-99-075 How many means of emergency escape must an employer provide? The employer must provide the following number of emergency escape means:

Structure	Number of escape means
Galleries (bin decks)	Two
Tunnels of grain elevators constructed after November 14, 1988	Two
Tunnels of grain elevators constructed on or before November 14, 1988	One

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-075, filed 11/3/97, effective 1/1/98; 88-23-054 (Order 88-25), § 296-99-075, filed 11/14/88.]

WAC 296-99-080 How must continuous-flow bulk raw grain dryers be equipped and installed? (1) The employer must ensure that all direct-heat grain dryers have automatic controls that:

- (a) Shut off the fuel supply in case of power, flame, or ventilation airflow shut-off; and
 - (b) Stop the grain flow into the dryer if the dryer exhaust gets too hot.
- (2) The employer must ensure that each direct-heat grain dryer installed after March 30, 1988, is:
- (a) Located outside the grain elevator; or
 - (b) When located inside the grain elevator, protected by a fire or explosion suppression system; or
 - (c) Isolated by a structure with at least a one hour fire-resistance rating.

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-080, filed 11/3/97, effective 1/1/98; 88-23-054 (Order 88-25), § 296-99-080, filed 11/14/88.]

WAC 296-99-085 What special requirements apply to inside bucket elevators? (1) The employer must prohibit jogging of a bucket elevator to free a choked leg.

"Jogging" means to start and stop drive motors repeatedly over short intervals.

(2) The employer must ensure that all belts and lagging purchased after March 30, 1988, are conductive and have a maximum surface electrical resistance of 300 megohms.

(3) The employer must ensure that all bucket elevators have safe access to the head pulley section for inspection of the head pulley, lagging, belt, and discharge throat. The boot section must also have safe access for its clean-out and inspection of the pulley and belt.

- (4) The employer must:
 - (a) Mount bearings externally to the leg casing; or

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- (b) Have vibration and temperature monitoring; or
- (c) Have other means to monitor the condition of bearings mounted inside or partially inside the leg casing.

(5) The employer must ensure that bucket elevators have a motion detection device that will stop the elevator if belt speed is reduced to less than eighty percent of normal operating speed.

(6) The employer must:

(a) Ensure that bucket elevators have a belt alignment monitoring device that will initiate an alarm to employees when the belt is not tracking properly; or

(b) Use a system to keep the belt tracking properly.

(7) Subsections (5) and (6) of this section do not apply to grain elevators with a permanent storage capacity of less than one million bushels, if daily visual inspection is made of bucket movement and belt tracking.

(8) Subsections (4), (5), and (6) of this section do not apply to the following:

(a) Bucket elevators with an operational fire and explosion suppression system capable of protecting at least the head and boot section of the bucket elevator; or

(b) Bucket elevators with pneumatic or other dust control systems or methods that keep the dust concentration inside the bucket elevator at least twenty-five percent below the lower explosive limit at all times during operations.

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-085, filed 11/3/97, effective 1/1/98; 88-23-054 (Order 88-25), § 296-99-085, filed 11/14/88.]

WAC 296-99-090 Reserved.

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-090, filed 11/3/97, effective 1/1/98; 88-23-054 (Order 88-25), § 296-99-090, filed 11/14/88.]

WAC 296-99-093 Reserved.

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-093, filed 11/3/97, effective 1/1/98; 88-23-054 (Order 88-25), § 296-99-093, filed 11/14/88.]

WAC 296-99-095 Reserved.

[Statutory Authority: Chapter 49.17 RCW. 97-22-065, § 296-99-095, filed 11/3/97, effective 1/1/98; 88-23-054 (Order 88-25), § 296-99-095, filed 11/14/88.]

Chapter 296-100 WAC

SAFETY REQUIREMENTS FOR MATERIAL HOISTS

WAC

296-100-001	Scope.
296-100-010	Material hoist platforms.
296-100-020	Inside material hoist shaftways.
296-100-030	Outside hoisting towers.
296-100-040	Hoisting machines.
296-100-050	Capacity plate.
296-100-060	Safety requirements for material hoists.

WAC 296-100-001 Scope. This standard applies to the design, construction, installation, operation, inspection, testing, maintenance, alterations, and repair of material hoists used to raise or lower materials during construction, alteration, or demolition. It is not applicable to the temporary use of permanently installed personnel elevators as material hoists.

[Title 296 WAC—p. 1923]

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-031 (Order 86-10), § 296-100-001, filed 1/10/86.]

WAC 296-100-010 Material hoist platforms. (1) Material hoist platforms shall be substantially constructed and of sufficient strength with a factor of safety of five for the rated load and capacity.

(2) Overhead protective covering of planking or heavy wire mesh shall be provided on the cross-head of every material hoist platform to prevent objects falling on the workmen when loading or unloading the hoist.

(3) The protection on the cross-head shall be made in sections and each section hinged, so they may be raised when hoisting long material.

(4) When using a hoist for long material, the several pieces of the material shall be securely fastened together, and made fast to the hoist so that no part of the load can fall or project beyond the sides of the hoist.

(5) Provide suitable blocking and cleats on all platforms when wheelbarrows or other rolling equipment are transported to hold them securely in place.

(6) Workmen shall not be allowed to ride on material hoists and a sign prohibiting such practice shall be posted on the cross bar of the platform or on the shaftway enclosure at each floor opening.

(7) The platforms of every hoist shall be enclosed on all sides where openings are not to be left with toeboards and a heavy wire screen enclosure formed of number sixteen U.S. gauge wire, one and one-half inch mesh.

[Order 70-11, § 296-100-010, filed 9/18/70, effective 10/21/70.]

WAC 296-100-020 Inside material hoist shaftways.

(1) All material hoist shaftways erected inside buildings shall preferably be enclosed tightly their entire height. When this is not practicable, the sides of shaftway not used for entrance shall be enclosed on each floor to a height of at least eight feet with wire netting formed of not less than number sixteen U.S. gauge wire, one and one-half inch mesh, or enclosed with wooden slats spaced vertically not more than four inches apart, with a toeboard placed around all sides except at the entrance.

(2) When two material shaftways are erected side by side, similar protection shall be placed between them.

(3) The enclosure shall extend at least two feet in front of the shaftway unless the entrances are protected with gates.

(4) All entrances into the shaftway shall be protected by hinges or pivoted bars or gates.

If bars are used, they shall not be less than two by three inches in section, placed at a height of not less than three feet nor more than four feet above the floor and located not nearer than two feet from the shaftway.

The bar shall be bolted to one side of the enclosure frame by a single bolt on which the bar may swing, and a slot provided at the opposite side to receive the end of the bar when it is lowered to a horizontal position. A hook or wooden button shall be provided to hold the bar up out of the way while loading or unloading the hoist.

If a gate is used, it shall be located not nearer than six inches from the front of the shaftway, at least five and one-half feet high, and the bottom not more than two inches off the floor.

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(5) The guide rails of all hoists shall be kept rigid and in perfect alignment at all times.

(6) The guide rails shall be of sound lumber or steel of adequate uniform size to provide a firm track.

(7) Overhead sheave beams and their supports shall be of good sound timber or steel of strength and stiffness with a factor of safety of five to support the combined live and dead loads imposed.

(8) Protective covering of planking or heavy wire netting shall be provided above the overhead work of all hoists to prevent objects falling down the shaftway.

[Order 70-11, § 296-100-020, filed 9/18/70, effective 10/21/70.]

WAC 296-100-030 Outside hoisting towers. (1) Material hoist towers erected outside of buildings shall be constructed of strong, sound material and of ample strength with a factor of safety of five to carry the loads intended.

(2) Foundations for hoist towers shall be sufficiently large to spread the hoist load so that it will not exceed the safe bearing capacity of the soil on which it stands. Foundations shall be level.

(3) Hoist towers shall be erected plumb, square at the corners and sufficiently braced to make them rigid and stable.

(4) All splicing material on posts shall be not less than two inches in thickness, four feet long, and shall be spiked or bolted to at least two adjacent sides of the posts. All splices shall be staggered.

(5) An approved ladder securely fastened to the tower shall extend its entire height.

(6) Hoist towers shall be securely guyed and well anchored.

(7) The guys shall be securely clamped to "dead men" of sufficient size and well buried.

(8) Platforms of ample size and strength with railings and toeboards shall be built at each level where men work.

(9) Hoist towers shall be enclosed on all sides to a height of eight feet at lower landing with wire screen enclosure formed of number sixteen U.S. gauge wire, and one and one-half inch mesh, or other suitable material, securely fastened to the tower structure to prevent access to the space under any hoist platform.

(10) The overhead framework of all towers shall be of sufficient strength to take the total load of all sheaves, car and material to be hoisted with a factor of safety of five.

(11) When extremely high hoist towers are to be erected, and it is not practical to fully secure this tower by means of bracing or guys, they shall be built in sections, by erecting the lower section to an altitude to suffice for immediate needs, and extending it upward when the construction work has progressed sufficiently to make it possible to provide a support or bracing for the tower.

(12) Standard railing and toeboards shall be placed on the open sides of runways connecting the tower to the structure, and a bar or gate provided at all openings into the tower.

[Order 70-11, § 296-100-030, filed 9/18/70, effective 10/21/70.]

WAC 296-100-040 Hoisting machines. (1) All gearing on hoisting machines shall be enclosed. If electrical equipment is used, it shall be effectively grounded.

(1999 Ed.)

(2) Hoisting machines shall be of ample capacity and equipped with brakes capable of sustaining one hundred and fifty percent of rated load for stopping and sustaining the maximum load in any position.

(3) Hoisting machines shall be protected against the weather and falling objects by a substantial covering.

(4) All hoisting equipment shall be frequently inspected, and brakes, gears and operating levers kept in perfect working condition.

(5) Guards shall be provided to prevent persons coming in contact with hoisting cables.

(6) Brake drums shall be kept free of oil or grease, as it prevents the brake from holding the load.

[Order 70-11, § 296-100-040, filed 9/18/70, effective 10/21/70.]

WAC 296-100-050 Capacity plate. Rated load capacities, recommended operating speeds, and special hazard warning or instructions shall be posted on cars and platforms.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-031 (Order 86-10), § 296-100-050, filed 1/10/86.]

WAC 296-100-060 Safety requirements for material hoists. All material hoists shall conform to the requirements of ANSI A10.5-1981.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-031 (Order 86-10), § 296-100-060, filed 1/10/86.]

Chapter 296-104 WAC

BOARD OF BOILER RULES—SUBSTANTIVE

WAC

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296-104-120	Inspection—Condemned boilers or unfired pressure vessel. [Statutory Authority: RCW 70.79.040. 91-11-107, § 296-104-120, filed 5/22/91, effective 6/22/91; Part III, § 5, filed 3/23/60.] Repealed by 95-19-058, filed 9/15/95, effective 10/16/95. Statutory Authority: RCW 70.79.030 and 70.79.040.
296-104-195	Pressure vessel clearances. [Statutory Authority: RCW 70.79.040. 90-04-009, § 296-104-195, filed 1/26/90, effective 2/26/90.] Repealed by 96-21-081, filed 10/16/96, effective 11/16/96. Statutory Authority: RCW 70.79.030 and 70.79.040.
296-104-201	Inspection of systems—Standard for water chillers. [Statutory Authority: RCW 70.79.030. 80-14-015 (Order 80-12), § 296-104-201, filed 9/23/80.] Repealed by 86-01-088 (Order 85-26), filed 12/19/85. Statutory Authority: RCW 70.79.040 and 70.79.050.
296-104-225	Inspection of systems—Reinstalled boiler or unfired pressure vessel. [Part IV, § 6, filed 3/23/60.] Repealed

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- by 96-21-081, filed 10/16/96, effective 11/16/96. Statutory Authority: RCW 70.79.030 and 70.79.040.
- 296-104-250 Inspection of systems—Hot water heating systems. [Part IV, § 11, filed 3/23/60.] Repealed by 78-03-057 (Order 78-3), filed 2/22/78. Statutory Authority: RCW 70.79.030.
- 296-104-275 Inspection of systems—Hydro-pneumatic tanks. [Part IV, § 16, filed 3/23/60.] Repealed by 78-03-057 (Order 78-3), filed 2/22/78. Statutory Authority: RCW 70.79.030.
- 296-104-280 Inspection of systems—Electric steam generators. [Part IV, § 17, filed 3/23/60.] Repealed by 78-03-057 (Order 78-3), filed 2/22/78. Statutory Authority: RCW 70.79.030.
- 296-104-315 New installations—Blow off tanks. [Statutory Authority: RCW 70.79.030, 78-03-057 (Order 78-3), § 296-104-315, filed 2/22/78; Part V, § 4, filed 3/23/60.] Repealed by 89-15-025 (Order 89-05), filed 7/13/89, effective 8/13/89. Statutory Authority: Chapter 70.79 RCW.
- 296-104-400 Existing installations—Stamping of existing boilers and unfired pressure vessels. [Statutory Authority: RCW 70.79.040, 90-20-029, § 296-104-400, filed 9/24/90, effective 10/25/90; Part VI, § 1, filed 3/23/60.] Repealed by 97-20-109, filed 9/30/97, effective 10/31/97. Statutory Authority: RCW 70.79.030 and 70.79.040.
- 296-104-410 Existing installations—Noncode steel heating boilers. [Part VI, § 3, filed 3/23/60.] Repealed by 97-20-109, filed 9/30/97, effective 10/31/97. Statutory Authority: RCW 70.79.030 and 70.79.040.
- 296-104-415 Existing installations—Noncode cast iron boilers. [Part VI, § 4, filed 3/23/60.] Repealed by 97-20-109, filed 9/30/97, effective 10/31/97. Statutory Authority: RCW 70.79.030 and 70.79.040.
- 296-104-500 Nonnuclear repairs. [Statutory Authority: RCW 70.79.040, 93-12-014, § 296-104-500, filed 5/21/93, effective 6/21/93; 92-11-070, § 296-104-500, filed 5/20/92, effective 6/20/92. Statutory Authority: RCW 70.79.030, 86-04-059 (Order 86-01), § 296-104-500, filed 2/4/86. Statutory Authority: RCW 70.79.030 and 70.79.330, 84-21-012 (Order 84-20), § 296-104-500, filed 10/5/84; Part VII, § 1, filed 3/23/60.] Repealed by 94-21-002, filed 10/5/94, effective 11/5/94. Statutory Authority: RCW 70.79.040.
- 296-104-501 Nonnuclear alterations. [Statutory Authority: RCW 70.79.040, 93-12-014, § 296-104-501, filed 5/21/93, effective 6/21/93; 92-11-070, § 296-104-501, filed 5/20/92, effective 6/20/92. Statutory Authority: RCW 70.79.030, 86-04-059 (Order 86-01), § 296-104-501, filed 2/4/86.] Repealed by 94-21-002, filed 10/5/94, effective 11/5/94. Statutory Authority: RCW 70.79.040.
- 296-104-505 Repairs—Repairs by fusion welding. [Part VII, § 2, filed 3/23/60.] Repealed by 94-21-002, filed 10/5/94, effective 11/5/94. Statutory Authority: RCW 70.79.040.
- 296-104-525 Repairs—Hydrostatic pressure tests. [Part VII, § 6, filed 3/23/60.] Repealed by 98-22-024, filed 10/28/98, effective 11/28/98. Statutory Authority: RCW 70.79.030 and 70.79.040.
- 296-104-600 General requirements—Conditions not covered by these rules. [Part VIII, § 1, filed 3/23/60.] Repealed by 98-22-024, filed 10/28/98, effective 11/28/98. Statutory Authority: RCW 70.79.030 and 70.79.040.
- 296-104-800 Inspection of systems subject to radioactivity. [Statutory Authority: RCW 70.79.240, 88-01-064 (Order 87-25), § 296-104-800, filed 12/17/87.] Repealed by 98-22-024, filed 10/28/98, effective 11/28/98. Statutory Authority: RCW 70.79.030 and 70.79.040.
- 296-104-801 Nuclear repairs/replacement. [Statutory Authority: RCW 70.79.040, 91-11-106, § 296-104-801, filed 5/22/91, effective 6/22/91.] Repealed by 98-22-024, filed 10/28/98, effective 11/28/98. Statutory Authority: RCW 70.79.030 and 70.79.040.
- 296-104-805 Nuclear repairs—Safety devices. [Statutory Authority: RCW 70.79.040, 91-11-106, § 296-104-805, filed 5/22/91, effective 6/22/91.] Repealed by 98-22-024, filed 10/28/98, effective 11/28/98. Statutory Authority: RCW 70.79.030 and 70.79.040.

WAC 296-104-001 Promulgation. The following rules and regulations apply to all boilers and unfired pressure vessels except those exempt under section 8, chapter 32, Laws of

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1951 (RCW 70.79.080). Boilers and unfired pressure vessels listed under section 9, chapter 32, Laws of 1951 (RCW 70.79.090) are exempt from inspection and fees, but shall comply with all rules for construction, installation, repairs and general requirements.

The following rules and regulations were formulated in accordance with the law and are hereby promulgated.
Date: December 18, 1958.

[Promulgation, filed 3/23/60.]

WAC 296-104-002 Approval by director. The following rules and regulations are hereby approved. They have the force and effect of law in accordance with section 5, chapter 32, Laws of 1951 (RCW 70.79.050).

Date: December 24, 1958

Department of Labor and Industries,
Jerry Hagan, Director

[Approval, filed 3/23/60.]

WAC 296-104-010 Definitions. "Agriculture purposes" shall mean any act performed on a farm in production of crops or livestock, and shall include the storage of such crops and livestock in their natural state, but shall not be construed to include the processing or sale of crops or livestock.

"API-510" shall mean the Pressure Vessel Inspection Code of the American Petroleum Institute with addenda and revisions, thereto made and approved by the institute which have been adopted by the board of boiler rules in accordance with the provisions of RCW 70.79.030.

"ASME Code" shall mean the boiler and pressure vessel code of the American Society of Mechanical Engineers with amendments thereto made and approved by the council of the society which have been adopted by the board of boiler rules in accordance with the provisions of RCW 70.79.030.

"Attendant" shall mean the person in charge of the operation of a boiler or unfired pressure vessel.

"Automatic operation of a boiler" shall mean unattended control of feed water and fuel in order to maintain the pressure and temperature within the limits set. Controls must be such that the operation follows the demand without interruption. Manual restart may be required when the burner is off because of low water, flame failure, power failure, high temperatures or pressures.

"Board of boiler rules" shall mean the board created by law and empowered under RCW 70.79.010.

"Certificate of competency" shall mean a certificate issued by the state board of boiler rules to a person who has passed an examination prescribed by the board of boiler rules.

"Chief inspector" shall mean the inspector appointed under RCW 70.79.100.

"Commission" shall mean an annual state commission/commission card issued to a person in the employ of the state, an insurance company or a company owner/user inspection agency holding a certificate of competency which authorizes them to perform inspections of boilers and/or unfired pressure vessels.

"Condemned boiler or unfired pressure vessel" shall mean a boiler or unfired pressure vessel that has been inspected and declared unsafe or disqualified by legal

requirements by an inspector who has applied a stamping or marking designating its condemnation.

"Department" as used herein shall mean the department of labor and industries of the state of Washington.

"Deputy inspector" shall mean an inspector appointed under RCW 70.79.120.

"Director" shall mean the director of the department of labor and industries.

"Domestic and/or residential purposes" shall mean serving a private residence or an apartment house of less than six families.

"Existing installations" shall mean any boiler or unfired pressure vessel constructed, installed, placed in operation, or contracted for before January 1, 1952.

"External inspection" shall mean an inspection made while a boiler or unfired pressure vessel is in operation and includes the inspection and demonstration of controls and safety devices required by these rules.

"Hot water heater" shall mean a closed vessel designed to supply hot water for external use to the system. All vessels must be listed by a nationally recognized testing agency and shall not exceed any of the following limits:

- (a) Pressure of 160 psi (1100 kpa);
- (b) Temperature of 210 degrees F (99 C);
- (c) Capacity of 120 U.S. gallon (454 liters);
- (d) Input of 200,000 BTU/hr (58.58 kw).

Each vessel shall be protected with an approved temperature and pressure safety relief valve.

"Inspector" shall mean the chief boiler inspector, a deputy inspector, or a special inspector.

"Internal inspection" shall mean an inspection made when a boiler or unfired pressure vessel is shut down and handholes, manholes, or other inspection openings are open or removed for examination of the interior. An external ultrasonic examination of unfired pressure vessels 36" inside diameter and under, shall constitute an internal inspection.

"Low pressure heating boiler" shall mean a steam or vapor boiler operating at a pressure not exceeding 15 psig or a boiler in which water or other fluid is heated and intended for operation at pressures not exceeding 160 psig or temperatures not exceeding 250 degrees F by the direct application of energy from the combustion of fuels or from electricity, solar or nuclear energy including lined potable water heaters.

"Nationwide engineering standard" shall mean a nationally accepted design method, formulae and practice acceptable to the board.

"NBIC" shall mean the National Board Inspection Code of the National Board of Boiler and Pressure Vessel Inspectors with addenda and revisions, thereto made and approved by the National Board of Boiler and Pressure Vessel Inspectors and adopted by the board of boiler rules in accordance with the provisions of RCW 70.79.030.

"Nonstandard boiler or unfired pressure vessel" shall mean a boiler or unfired pressure vessel that does not bear marking of the codes adopted in WAC 296-104-200.

"Owner" or "user" shall mean a person, firm, or corporation owning or operating any boiler or unfired pressure vessel within the state.

"Owner/user inspection agency" shall mean an owner or user of pressure vessels that maintains an established inspec-

tion department, whose organization and inspection procedures meet the requirements of a nationally recognized standard acceptable to the department.

"Place of public assembly" or "assembly hall" shall mean a building or portion of a building used for the gathering together of 50 or more persons for such purposes as deliberation, education, instruction, worship, entertainment, amusement, drinking, or dining or waiting transportation. This shall also include child care centers (those agencies which operate for the care of thirteen or more children), public and private hospitals, nursing and boarding homes.

"Power boiler" shall mean a boiler in which steam or other vapor is generated at a pressure of more than 15 psig for use external to itself or a boiler in which water or other fluid is heated and intended for operation at pressures in excess of 160 psig and/or temperatures in excess of 250 degrees F by the direct application of energy from the combustion of fuels or from electricity, solar or nuclear energy.

"Reinstalled boiler or unfired pressure vessel" shall mean a boiler or unfired pressure vessel removed from its original setting and reset at the same location or at a new location without change of ownership.

"Rental boiler" shall mean any power or low pressure heating boiler that is under a rental contract between owner and user.

"Second hand boiler or unfired pressure vessel" shall mean a boiler or unfired pressure vessel of which both the location and ownership have changed after primary use.

"Special design" shall mean a design using nationwide engineering standards other than the codes adopted in WAC 296-104-200 or other than allowed in WAC 296-104-230.

"Special inspector" shall mean an inspector holding a Washington commission identified under RCW 70.79.130.

"Standard boiler or unfired pressure vessel" shall mean a boiler or unfired pressure vessel which bears the marking of the codes adopted in WAC 296-104-200.

"Unfired pressure vessel" shall mean a closed vessel under pressure excluding:

- (a) Fired process tubular heaters;
- (b) Pressure containers which are integral parts of components of rotating or reciprocating mechanical devices where the primary design considerations and/or stresses are derived from the functional requirements of the device;
- (c) Piping whose primary function is to transport fluids from one location to another;
- (d) Those vessels defined as low pressure heating boilers or power boilers.

"Unfired steam boiler" shall mean a pressure vessel in which steam is generated by an indirect application of heat. It shall not include pressure vessels known as evaporators, heat exchangers, or vessels in which steam is generated by the use of heat resulting from the operation of a processing system containing a number of pressure vessels, such as used in the manufacture of chemical and petroleum products, which will be classed as unfired pressure vessels.

[Statutory Authority: RCW 70.79.030 and 70.79.040, 98-22-024, § 296-104-010, filed 10/28/98, effective 11/28/98; 96-21-081, § 296-104-010, filed 10/16/96, effective 11/16/96. Statutory Authority: RCW 70.79.040, 94-21-002, § 296-104-010, filed 10/5/94, effective 11/5/94; 93-12-014, § 296-104-010, filed 5/21/93, effective 6/21/93; 92-11-070, § 296-104-010, filed 5/20/92, effective 6/20/92. Statutory Authority: RCW 70.79.240, 88-01-064

(Order 87-25), § 296-104-010, filed 12/17/87. Statutory Authority: RCW 70.79.040 and 70.79.050. 86-01-088 (Order 85-26), § 296-104-010, filed 12/19/85; Order 72-11, § 296-104-010, filed 7/7/72; Part I, filed 3/23/60.]

WAC 296-104-015 Administration—Board meetings.

The board of boiler rules shall hold its regular meetings in January, March, May, September and November of each year. The time, place, and date of each regular meeting shall be set by the chairman of the board and published annually. Special meetings may be called by the chairman when considered necessary by the board. The chief inspector will serve as secretary to the board without vote.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-015, filed 9/15/95, effective 10/16/95. Statutory Authority: RCW 70.79.040. 91-11-107, § 296-104-015, filed 5/22/91, effective 6/22/91. Statutory Authority: RCW 70.79.050. 90-07-082, § 296-104-015, filed 3/21/90, effective 4/21/90. Statutory Authority: RCW 70.79.040 and 70.79.050. 86-01-088 (Order 85-26), § 296-104-015, filed 12/19/85; Order 72-11, § 296-104-015, filed 7/7/72.]

WAC 296-104-017 Administration—How are rules affected if other rules are invalidated? Should any section, subsection, sentence, clause, phrase, provision or exemption of these rules be declared unconstitutional or invalid for any reason, such invalidity shall not affect the remaining portion or provisions.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 98-22-024, § 296-104-017, filed 10/28/98, effective 11/28/98.]

WAC 296-104-018 Administration—Rule interpretation and revision. Interpretations will be brought to the board if the inquirer is aggrieved by the interpretation of the chief inspector (RCW 70.79.360). The board will consider written requests for interpretations and revisions to these definitions, rules, and regulations. Inquiries shall be limited to requests for interpretation of the rules or to proposed revisions to the existing rules and shall be submitted in the following format:

(1) Scope. Involve a single rule or closely related rules.

(2) Background. State the purpose of the inquiry, which should be either to obtain an interpretation or to propose a revision to existing rules. Provide concise information needed for the board's understanding of the inquiry, including references to the WAC section as well as other code and/or standards paragraphs.

(3) Inquiry structure. Provide statements in a condensed and precise question format and, where appropriate, compose in such a way that "yes" or "no" (perhaps with provisos) would be an acceptable reply.

(4) Proposed reply. State what it is believed the rule requires. If in the inquirer's opinion a revision to the definitions, rules, and regulations is needed, recommended wording should be provided.

Inquiries shall be submitted to:

Board of Boiler Rules

% Chief Inspector

Department of Labor & Industries

B&CSIS

Boiler Section

P.O. Box 44410

Olympia, WA 98504-4410

[Statutory Authority: RCW 70.79.040. 92-11-070, § 296-104-018, filed 5/20/92, effective 6/20/92.]

WAC 296-104-020 Administration—Filing requirements before installation. Manufacturers data reports on boilers and pressure vessels as required by the provisions of the ASME Code shall be filed by the owner or his agent with the chief inspector or the National Board of Boiler and Pressure Vessel Inspectors before installation. When the boilers or pressure vessel are of special design or construction not covered by the ASME Code (unless otherwise exempted by the rules and regulations), the owner or user shall apply to the board of boiler rules in writing for permission to install such boilers or pressure vessels and shall supply such details of design and construction as may be required by the board of boiler rules and approval shall be secured before construction is started. When second hand boilers or pressure vessels are to be reinstalled, the owner or user shall file a data report or construction details, as required, and secure approval from the chief inspector before starting installation.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-020, filed 9/15/95, effective 10/16/95; Order 74-37, § 296-104-020, filed 11/8/74; Part II, § 1, filed 3/23/60.]

WAC 296-104-025 Administration—Owner to notify chief inspector of accidents. When an accident occurs which renders a boiler or unfired pressure vessel inoperative, the owner or user shall notify the chief inspector, and submit a detailed report of the accident. In cases of accidents, such as explosions or those resulting in personal injury, notice to the chief inspector shall be given immediately by telephone or electronic means designed to assure its earliest possible receipt. Neither the boiler or unfired pressure vessel nor any parts thereof shall be removed or disturbed before an inspection has been made by the chief inspector, or his designee except for the purpose of saving life or limiting consequential damage. The inspector making the investigation and inspection shall report to the chief inspector as soon as possible. The boiler or pressure vessel owner shall be responsible for all costs of the department's investigation.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 96-21-081, § 296-104-025, filed 10/16/96, effective 11/16/96; 95-19-058, § 296-104-025, filed 9/15/95, effective 10/16/95; Part II, § 2, filed 3/23/60.]

WAC 296-104-030 Administration—Penalty for operation of unsafe boilers or unfired pressure vessels. In the event that a boiler or unfired pressure vessel is unsafe to operate, the inspection certificate shall be suspended. Any person, firm, partnership, or corporation causing such objects to be operated under pressure without a valid certificate of inspection shall be in violation of RCW 70.79.320 and subject to the penalties specified in WAC 296-104-701.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-030, filed 9/15/95, effective 10/16/95; Part II, § 3, filed 3/23/60.]

WAC 296-104-035 Administration—Conflict of interests. Inspectors commissioned by the state of Washington shall not engage in the sale of any service, article, or device or promote any other activity for personal gain relating to boilers or unfired pressure vessels or their appurtenances.

[Statutory Authority: RCW 70.79.030 and 70.79.040, 95-19-058, § 296-104-035, filed 9/15/95, effective 10/16/95; Part II, § 4, filed 3/23/60.]

WAC 296-104-040 Administration—Inspector's inspection reports. Inspectors shall submit reports of inspections of boilers and unfired pressure vessels on appropriate forms approved by the chief inspector. Routine reports of inspections shall be submitted within thirty days of inspection. Reports of reinspection after suspension of an inspection certificate shall be submitted by an inspector employed by the in-service inspection agency as soon as notice of corrective action has been received so that the vessel certificate can be reinstated and the boiler or unfired pressure vessel lawfully operated.

[Statutory Authority: RCW 70.79.030 and 70.79.040, 95-19-058, § 296-104-040, filed 9/15/95, effective 10/16/95; Order 74-37, § 296-104-040, filed 11/8/74; Part II, § 5, filed 3/23/60.]

WAC 296-104-045 Administration—Insurance companies' responsibilities. All insurance companies shall notify the chief inspector within thirty days of all boiler or unfired pressure vessel risks written, canceled, not renewed or suspended because of unsafe conditions. Special inspectors shall perform all in-service inspections of boilers and unfired pressure vessels insured by their employer. After a repair or alteration the in-service inspector is responsible to assure an R-1 form is completed and submitted to the department.

[Statutory Authority: RCW 70.79.030 and 70.79.040, 95-19-058, § 296-104-045, filed 9/15/95, effective 10/16/95; Part II, § 6, filed 3/23/60.]

WAC 296-104-050 Administration—Examination for inspector. Examination for certificate of competency shall be held at locations selected by the board, four times each year, namely, the first Wednesday of the months of March, June, September and December. Special examinations will be held when considered necessary by the board.

Applicants for examination shall have had at least three years practical experience in the construction, maintenance, repair or operation of high pressure boilers or unfired pressure vessels as a mechanical engineer, steam engineer or boiler maker, or shall have had at least three years experience as an inspector of high pressure boilers and/or unfired pressure vessels. A credit of two years of the required experience will be given to applicants holding an engineering degree from a recognized college of engineering.

Application for examination for certificate of competency shall be in writing upon a form to be furnished by the director stating the school education of the applicant, a list of his employers, his period of employment and position held with each employer. Applications containing willful falsification or untruthful statements shall be rejected. If the applicant's history and experience meet with the approval of the board of boiler rules, he shall be given a written examination dealing with Washington state boilers and unfired pressure law as well as the construction, installation, operation, maintenance and repair of boilers and/or unfired pressure vessels and their appurtenances, and the applicant shall be accepted or rejected on the merits of this examination. If the applicant is successful in meeting the requirements of the examining board, a certificate of competency will be issued.

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[Statutory Authority: RCW 70.79.040, 94-21-002, § 296-104-050, filed 10/5/94, effective 11/5/94. Statutory Authority: Chapter 70.79 RCW, 89-15-025 (Order 89-05), § 296-104-050, filed 7/13/89, effective 8/13/89. Statutory Authority: RCW 70.79.030, 78-03-057 (Order 78-3), § 296-104-050, filed 2/22/78; Part II, § 7, filed 3/23/60.]

WAC 296-104-055 Examination fees. A fee of sixty dollars will be charged for each applicant taking the examination for a certificate of competency or any examination sponsored by the National Board of Boiler and Pressure Vessel Inspectors. If an applicant fails to pass the examination this fee shall be good for one year during which a reexamination may be taken. Checks for examination fees shall be made payable to the state treasurer.

[Statutory Authority: RCW 70.79.040, 93-12-014, § 296-104-055, filed 5/21/93, effective 6/21/93. Statutory Authority: RCW 70.79.030 and 70.79.330, 82-24-025 (Order 82-36), § 296-104-055, filed 11/23/82, effective 1/1/83; Order 74-37, § 296-104-055, filed 11/8/74; Part II, § 8, filed 3/23/60.]

WAC 296-104-060 Commissions as inspectors. Upon the request of any company authorized to insure and insuring against loss from explosion of boilers and pressure vessels in this state, or upon the request of any company with an owner/user inspection agency operating pressure vessels in this state, the chief inspector shall issue a commission as a special inspector and an identifying commission card to any inspector actively engaged in boiler or pressure vessel inspection in this state if the inspector is employed by the requesting company and if the inspector has passed the written examination and holds a certificate of competency as set forth in WAC 296-104-050. The fee for the commission is twenty-five dollars. The commission shall be held at the home office of the employing company. Inspectors shall carry identifying commission cards while they are inspecting. A commission shall be valid for one year and may be renewed annually at the request of the employing company for a fee of ten dollars. The employing company shall return the commission and the identifying commission card at once to the chief inspector when the inspector to whom the commission was issued is no longer in its employ, or at the request of the chief inspector. The department may suspend or revoke a certificate of competency and commission issued to an inspector upon ten days notice to the inspector and to the inspector's employer for incompetency or untrustworthiness; for willful falsification of any matter or statement contained in his application, or in the report of any inspection, or in any other application; or for other sufficient reason. The holder of a certificate of competency is entitled to a hearing before the board prior to the revocation or suspension of the certificate of competency. A person whose commission has been suspended, except for untrustworthiness, may apply to the board for reinstatement. A person whose commission has been revoked, except for untrustworthiness, may apply to the board to take a new examination for a commission after ninety days from the date of the revocation.

[Statutory Authority: RCW 70.79.040, 94-21-002, § 296-104-060, filed 10/5/94, effective 11/5/94. Statutory Authority: RCW 70.79.030 and 70.79.330, 82-24-025 (Order 82-36), § 296-104-060, filed 11/23/82, effective 1/1/83; Order 74-37, § 296-104-060, filed 11/8/74; Part II, § 9, filed 3/23/60.]

[Title 296 WAC—p. 1929]

WAC 296-104-065 Administration—Reciprocal commissions. Upon the request of a boiler insurance company authorized to insure and insuring against loss from explosion of boilers and pressure vessels in this state, or a company with an owner/user inspection agency, a commission as a special inspector of boilers and/or unfired pressure vessels shall be issued by the chief inspector to an inspector in the employ of such company provided the inspector has had the experience prescribed in RCW 70.79.130 and:

(1) Holds a certificate of competency or commission issued by a state which has adopted one or more sections of the ASME Code, or a national board commission, in either case having taken and passed a written examination equivalent to that required by the state of Washington; or

(2) Is certified by the American Petroleum Institute in accordance with API-510, having taken and passed a written examination equivalent to that required by the state of Washington.

Application for a reciprocal commission shall be made on a form to be furnished by the chief inspector, and shall be accompanied by a copy of the applicant's certificate of competency or a National Board Commission; or an API certificate and evidence of having passed the API examination.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 96-21-081, § 296-104-065, filed 10/16/96, effective 11/16/96. Statutory Authority: RCW 70.79.040. 94-21-002, § 296-104-065, filed 10/5/94, effective 11/5/94. Statutory Authority: RCW 70.79.030. 78-03-057 (Order 78-3), § 296-104-065, filed 2/22/78; Order 74-37, § 296-104-065, filed 11/8/74; Part II, § 10, filed 3/23/60.]

WAC 296-104-100 Inspection—How often must boilers and unfired pressure vessels be inspected? (1) Power boilers shall be inspected:

(a) Internally and externally while not under pressure - Annually.

(b) Externally while under pressure - Annually.

(2) Organic vapor boilers shall be inspected:

(a) Internally and externally while not under pressure - Biennially.

(b) Externally while under pressure - Annually.

(3) Low pressure heating boilers shall be inspected:

(a) Externally while under pressure - Biennially.

(b) Internally while not under pressure (except where construction does not permit an internal) - Biennially.

(c) Internally, all steam heating boilers will have as a minimum, an internal of their low water fuel cutoff - Biennially.

(d) Internally, none required for nonvapor boilers using glycol, oil or adequately treated with a corrosion inhibitor.

(4) Hot water heaters shall be inspected:

(a) Externally - Biennially.

(b) Internally - None required.

(5) Unfired pressure vessels shall be inspected:

(a) Externally - Biennially.

(b) Internally:

(i) When subject to corrosion and construction permits - Biennially; or

(ii) Vessels in an owner/user inspection program may follow intervals established by the NBIC or API-510, provided nondestructive examination (NDE) is performed at the biennial external inspection; or

(iii) Pulp or paper dryer rolls may be inspected on a five-year basis in accordance with TAPPI TIS 0402-16, provided the owner has established a written inspection program accepted by the inspector that requires the minimums in section 8 of TAPPI TIS 0402-16; or

(iv) Vessels not subject to corrosion do not require an internal.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 98-22-024, § 296-104-100, filed 10/28/98, effective 11/28/98; 95-19-058, § 296-104-100, filed 9/15/95, effective 10/16/95. Statutory Authority: RCW 70.79.040. 94-21-002, § 296-104-100, filed 10/5/94, effective 11/5/94; Part III, § 1, filed 3/23/60.]

WAC 296-104-102 Inspection—What are the standards for in-service inspection? (1) Where a conflict exists between the requirements of the standards listed below and this chapter, this chapter shall prevail.

(2) The standard for inspection of nonnuclear boilers, unfired pressure vessels, and safety devices is the National Board Inspection Code (NBIC), 1995 edition, with addenda. This code may be used on or after the date of issue and becomes mandatory twelve months after adoption by the board as specified in RCW 70.79.050(2).

(3) The standard for inspection of nuclear items is ASME section XI. The ASME Code edition and addenda shall be as specified in the owner in-service inspection program plan.

(4) Where a petroleum or chemical process industry owner/user inspection agency so chooses, the standard for inspection of unfired pressure vessels used by the owner shall be the API-510 Pressure Vessel Inspection Code, eighth edition, with supplements. This code may be used on or after the date of issue.

(5) TAPPI TIS 0402-16, dated 1995 may be used for both pulp dryers and paper machine dryers when requested by the owner. When requested by the owner, this document becomes a requirement and not a guideline.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 98-22-024, § 296-104-102, filed 10/28/98, effective 11/28/98; 96-21-081, § 296-104-102, filed 10/16/96, effective 11/16/96. Statutory Authority: RCW 70.79.040. 94-21-002, § 296-104-102, filed 10/5/94, effective 11/5/94.]

WAC 296-104-105 Inspection—Notification of inspection. The owner or user shall prepare each boiler and unfired pressure vessel for internal inspection and shall prepare for and apply a hydrostatic pressure test whenever necessary on the date specified by the inspector. Seven days will be considered sufficient notification.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-105, filed 9/15/95, effective 10/16/95; Part III, § 2, filed 3/23/60.]

WAC 296-104-107 Inspection—Which unfired pressure vessels in places of public assembly are subject to these rules? All unfired pressure vessels in places of public assembly are subject to these rules except those:

(1) Less than 1 1/2 cubic feet (11.25 gallon) in volume with a safety valve setting of 150 psi, or less; or

(2) Less than 6 inches in diameter, and less than 5 cubic feet (37.5 gallon) in volume with a safety valve set at any pressure.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 97-20-109, § 296-104-107, filed 9/30/97, effective 10/31/97.]

WAC 296-104-110 Inspection—Unsafe or defective boilers or unfired pressure vessels. If an inspector, upon inspection of a boiler or unfired pressure vessel or appurtenances finds hazardous conditions such that it is unsafe to operate under pressure, remedial action shall be initiated at once. A red tag indicating "unsafe - do not use" shall be attached to the principle operating control and the owner or user advised that further operation is prohibited until specified repairs or other action are taken. The chief inspector shall be notified immediately, followed by a report on the condition. Any certificate in force is considered suspended. When reinspection establishes that necessary repairs have been made or corrective action taken so that the boiler or unfired pressure vessel is safe to operate, a report of reinspection shall be submitted to the chief inspector. The certificate of inspection will then be reinstated or a new certificate issued as appropriate.

If other defects, but not unsafe conditions, are found, a routine inspection report containing a noncompliance report shall be submitted to the chief inspector and the owner or user allowed to operate the object for a period as specified by the inspector until corrective action is completed.

[Statutory Authority: RCW 70.79.030 and 70.79.040, 95-19-058, § 296-104-110, filed 9/15/95, effective 10/16/95; Part III, § 3, filed 3/23/60.]

WAC 296-104-115 Inspection—Defective conditions concealed by covering. If upon an external inspection there is evidence of a leak or crack, enough of the covering of the boiler or unfired pressure vessel shall be removed to satisfy the inspector in order that he/she may determine as to the safety of the boiler or unfired pressure vessel, or if the covering cannot be removed at the time, he may order the operation of the boiler or unfired pressure vessel stopped until such time as the covering can be removed and proper examination made.

[Statutory Authority: RCW 70.79.030 and 70.79.040, 95-19-058, § 296-104-115, filed 9/15/95, effective 10/16/95; Part III, § 4, filed 3/23/60.]

WAC 296-104-125 Inspection—Certificate fees. If upon inspection a boiler or unfired pressure vessel is found to be suitable for use and to conform to these rules and regulations, the owner or user shall pay directly to the chief inspector fees as scheduled in RCW 70.79.290. Inspections are not complete until the certificate of inspection is posted.

If the owner or user of each boiler or unfired pressure vessel required to be inspected refuses to allow an inspection to be made, or refuses to pay the above fee, the certificate of inspection shall be suspended by the chief inspector until the owner or user complies with the requirements.

[Part III, § 6, filed 3/23/60.]

WAC 296-104-130 Inspection—Validity of inspection certificate. An inspection certificate, issued in accordance with RCW 70.79.290, shall be valid until expiration unless some defect or condition affecting the safety of the boiler or unfired pressure vessel is disclosed or the conditions of RCW 70.79.300 apply.

When portable unfired pressure vessels are inspected and certified by the state or the city jurisdictions of Spokane, Seattle or Tacoma, the certificates will be considered valid

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certificates provided they are posted on or near the vessel, and provided there is an agreement between that city and the state.

[Statutory Authority: RCW 70.79.030 and 70.79.040, 95-19-058, § 296-104-130, filed 9/15/95, effective 10/16/95; Part III, § 7, filed 3/23/60.]

WAC 296-104-135 Inspection—Restamping of boilers and unfired pressure vessels. When the stamping on a boiler or unfired pressure vessel becomes indistinct the inspector shall instruct the owner or user to have it restamped. Request for permission to restamp the boiler or unfired pressure vessel shall be made to the chief inspector and proof of the original stamping shall accompany the request. Restamping authorized by the chief inspector shall be done only in the presence of an inspector, and shall be identical with the original stamping except that it will not be required to restamp the ASME symbol. Notice of completion of such restamping shall be filed with the chief boiler inspector by the inspector who witnessed the restamping of the boiler or unfired pressure vessel together with a facsimile of the stamping applied.

[Statutory Authority: RCW 70.79.030 and 70.79.040, 95-19-058, § 296-104-135, filed 9/15/95, effective 10/16/95; Part III, § 8, filed 3/23/60.]

WAC 296-104-140 Inspection—State stamp. Upon completion of the installation, all boilers and unfired pressure vessels shall be inspected by the chief inspector, a deputy inspector, or a special inspector. At the time of this inspection, each boiler or unfired pressure vessel shall be marked with a serial number of the state of Washington followed by the letter "W," said letter and figures to be not less than 5/16 in. in height. The marking shall not be concealed by lagging or paint and shall be exposed at all times.

Data sheets shall be made available at the time of first inspection if not filed with the national board.

Washington special numbers when assigned by the chief inspector shall be preceded by the letters: WS.

All rental boilers used in the state of Washington shall be marked with the serial number of the state of Washington followed by the letters "WR." This will indicate that the boiler is a rental unit. The numbers and letters shall not be less than 5/16 inch in height. The marking shall not be concealed by lagging or paint and shall be exposed at all times.

[Statutory Authority: RCW 70.79.030 and 70.79.040, 96-21-081, § 296-104-140, filed 10/16/96, effective 11/16/96; 95-19-058, § 296-104-140, filed 9/15/95, effective 10/16/95; Order 73-1, § 296-104-140, filed 3/22/73; Part III, § 9, filed 3/23/60.]

WAC 296-104-145 Inspection of systems. A group of unfired pressure vessels operating as a single unit such as the vessels in a refrigeration system, evaporators, ironers and paper machines may be given one number, designating the different vessels of the unit as a-b-c, etc. The inspector's report shall cover all pressure vessels in the system individually. One certificate shall be issued for the unit. Certificate charge shall be as outlined in RCW 70.79.290, for each vessel of the system.

[Statutory Authority: RCW 70.79.030 and 70.79.040, 95-19-058, § 296-104-145, filed 9/15/95, effective 10/16/95; Part III, § 10, filed 3/23/60.]

WAC 296-104-150 Inspection—Unfired steam boilers. Unfired steam boilers operating at pressures of 50 psi or more shall be inspected as power boilers. Unfired steam boilers operating at less than 50 psi shall be inspected as unfired pressure vessels.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-150, filed 9/15/95, effective 10/16/95; Part III, § 11, filed 3/23/60.]

WAC 296-104-151 Inspection—Rental boilers. Any rental boiler used in the state of Washington will have an internal inspection completed once a year. An operating inspection under pressure shall be conducted by the chief inspector, a deputy inspector, or a special inspector at each and every rental location before being placed into service.

Any rental boiler which has never been in rental service in the state of Washington will have a satisfactory hydrostatic test completed along with an initial internal inspection prior to having a state number issued. Each operating inspection will be reported to the state of Washington using the standard inspection form and a copy of report posted on the rental boiler.

Inspections will be the responsibility of the rental boiler owner but may be completed by the user's special inspector.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 96-21-081, § 296-104-151, filed 10/16/96, effective 11/16/96.]

WAC 296-104-155 Inspection—Preparation for internal inspection. The owner or user shall prepare a boiler for internal inspection in the following manner or as required by the inspector:

(a) Water shall be drawn off and the boiler thoroughly washed.

(b) All manhole and handhole plates and wash-out plugs and water column connections shall be removed, the furnace and combustion chambers thoroughly cooled and cleaned.

(c) All grates of internally fired boilers shall be removed.

(d) At each annual inspection brickwork shall be removed as required by the inspector in order to determine the condition of the boiler headers, furnace, supports, or other parts.

(e) The steam gauge shall be removed for testing or evidence of testing shown.

(f) Any leakage of steam or hot water into the boiler shall be cut off by disconnecting the pipe or valve at the most convenient point.

(g) The low water cutout shall be disassembled to such a degree as the inspector shall require.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-155, filed 9/15/95, effective 10/16/95; Part III, § 12, filed 3/23/60.]

WAC 296-104-160 Inspection—Boilers or unfired pressure vessels improperly prepared for inspection. If a boiler or unfired pressure vessel has not been properly prepared for an internal inspection, or the owner or user fails to comply with the requirements for hydrostatic test as set forth in these rules, the inspector may decline to make the inspection or test and the certificate of inspection shall be withheld until the owner or user complies with the requirements.

Unfired pressure vessels shall be prepared for inspection to the extent deemed necessary by the inspector.

[Title 296 WAC—p. 1932]

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-160, filed 9/15/95, effective 10/16/95; Part III, § 13, filed 3/23/60.]

WAC 296-104-165 Inspection—Removal of covering to permit inspection. If the boiler or unfired pressure vessel is jacketed so that the longitudinal seams of shells, drums, or domes cannot be seen, enough of the jacketing, setting wall, or other form of casing or housing shall be removed so that the size of the rivets, pitch of the rivets, and other data necessary to determine the safety of the boiler or unfired pressure vessel may be obtained provided such information cannot be determined by other means.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 95-19-058, § 296-104-165, filed 9/15/95, effective 10/16/95; Part III, § 14, filed 3/23/60.]

WAC 296-104-170 Inspection—Shop inspections. Shop inspections shall be as required in the applicable sections of the ASME Code. Only inspectors holding a national board commission with the appropriate endorsements and a commission issued by the state of Washington shall make shop inspections in this state. Supervisors of inspectors who perform shop inspections in the state need only a National Board Commission with the appropriate endorsements.

Upon request from a boiler or pressure vessel manufacturer holding an ASME Certificate of Authorization within the jurisdiction, the department shall provide inspection services as required by the ASME Code. The manufacturer receiving such inspection services shall reimburse the department for the time and expenses in accordance with the fee schedule established in WAC 296-104-700.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 96-21-081, § 296-104-170, filed 10/16/96, effective 11/16/96. Statutory Authority: RCW 70.79.040. 90-20-029, § 296-104-170, filed 9/24/90, effective 10/25/90. Statutory Authority: RCW 70.79.030. 78-03-057 (Order 78-3), § 296-104-170, filed 2/22/78; Part III, § 15, filed 3/23/60.]

WAC 296-104-180 Inspection—How are radioactive systems inspected? An alternative means of inspection is allowed when a pressure vessel has radioactive contamination that would not allow entering for visual inspection. The inspector and owner shall work out a program of nondestructive examination that shall ascertain the condition of the vessel to assure its integrity.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 98-22-024, § 296-104-180, filed 10/28/98, effective 11/28/98.]

WAC 296-104-200 Construction—What are the standards for new construction? The standards for new construction are:

(1) ASME Boiler and Pressure Vessel Code, 1998 edition, Sections I, III, IV, VIII, X, and CSD-1 (for boilers with fuel input ratings less than 12,500,000 BTU/hr);

(2) ASME/ANSI PVHO-1 (Standard for Pressure Vessels for Human Occupancy), 1987 edition; and

(3) Standards of construction meeting the National Board Criteria for Registration of Boilers, Pressure Vessels and Other Pressure Retaining Items, Revision 2, provided the boilers and unfired pressure vessels are registered with the National Board.

These codes and standards may be used on or after the date of issue and become mandatory twelve months after adoption by the board as specified in RCW 70.79.050(2). The

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board recognizes that the ASME Code states that new editions of the code become mandatory on issue and that subsequent addenda become mandatory six months after the date of issue. For nuclear systems, components and parts the time period for addenda becoming mandatory is defined in the Code of Federal Regulations.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 98-22-024, § 296-104-200, filed 10/28/98, effective 11/28/98; 97-20-109, § 296-104-200, filed 9/30/97, effective 10/31/97; 96-21-081, § 296-104-200, filed 10/16/96, effective 11/16/96. Statutory Authority: RCW 70.79.040. 93-12-014, § 296-104-200, filed 5/21/93, effective 6/21/93; 92-11-070, § 296-104-200, filed 5/20/92, effective 6/20/92; 91-11-107, § 296-104-200, filed 5/22/91, effective 6/22/91; 90-04-009, § 296-104-200, filed 1/26/90, effective 2/26/90. Statutory Authority: RCW 70.79.040 and 70.79.050. 86-01-088 (Order 85-26), § 296-104-200, filed 12/19/85. Statutory Authority: RCW 70.79.030 and 70.79.330. 84-11-016 (Order 84-09), § 296-104-200, filed 5/10/84; 82-24-025 (Order 82-36), § 296-104-200, filed 11/23/82, effective 1/1/83. Statutory Authority: RCW 70.79.030. 82-05-003 (Order 82-2), § 296-104-200, filed 2/4/82; 81-12-012 (Order 81-10), § 296-104-200, filed 5/28/81; 81-01-114 (Order 80-28), § 296-104-200, filed 12/24/80; 80-05-065 (Order 80-7), § 296-104-200, filed 4/23/80; 79-05-054 (Order 79-7), § 296-104-200, filed 4/30/79; 78-10-096 (Order 78-19), § 296-104-200, filed 10/3/78; Order 77-23, § 296-104-200, filed 11/8/77; Order 77-9, § 296-104-200, filed 5/26/77; Order 75-35, § 296-104-200, filed 10/29/75; Order 74-37, § 296-104-200, filed 11/8/74; Order 73-1, § 296-104-200, filed 3/22/73; Order 72-17, § 296-104-200, filed 9/28/72; Order 72-11, § 296-104-200, filed 7/7/72; Part IV, § 1, filed 3/23/60.]

WAC 296-104-205 Construction—Nonstandard new construction. Those boilers and unfired pressure vessels that are exempted by the codes adopted in WAC 296-104-200 due to volume, temperature or pressure requirements, and are not to be constructed to those codes, must be certified by a nationally recognized testing agency or constructed to WAC 296-104-230.

Other boilers and unfired pressure vessels that are not to be constructed to the codes adopted in WAC 296-104-200 may be treated as special designs at the discretion of the board. Nonstandard construction shall not be permitted to avoid standard construction.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 96-21-081, § 296-104-205, filed 10/16/96, effective 11/16/96; Part IV, § 2, filed 3/23/60.]

WAC 296-104-210 Construction—Special designs. Boilers and unfired pressure vessels of special design require a special certificate granted by the board. At a minimum the following shall be supplied to obtain board approval for special designs: Prints, calculations, and a Washington state professional engineer's evaluation of the design. Upon board approval a Washington special number will be assigned by the chief inspector. The installation will be subject to the regular inspections required by WAC 296-104-100 and any additional conditions as required by the board.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 96-21-081, § 296-104-210, filed 10/16/96, effective 11/16/96. Statutory Authority: RCW 70.79.040 and 70.79.050. 86-07-064 (Order 86-02), § 296-104-210, filed 3/19/86; Order 73-1, § 296-104-210, filed 3/22/73; Part IV, § 3, filed 3/23/60.]

WAC 296-104-215 Construction—Nonstandard boilers and unfired pressure vessels. Nonstandard boilers and unfired pressure vessels constructed prior to January 1, 1952, may be used provided they have not been moved from their original setting since January 1, 1952.

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[Statutory Authority: RCW 70.79.030 and 70.79.040. 97-20-109, § 296-104-215, filed 9/30/97, effective 10/31/97; 96-21-081, § 296-104-215, filed 10/16/96, effective 11/16/96; Part IV, § 4, filed 3/23/60.]

WAC 296-104-220 Construction—Nonstandard second hand boilers or unfired pressure vessels. Nonstandard second hand boilers or unfired pressure vessels constructed after January 1, 1952, cannot be used in this state without prior approval of the board of boiler rules. At a minimum the following shall be supplied to obtain board approvals: Prints, a history, calculations, and a Washington state professional engineer's evaluation of the design and present condition. Upon board approval a Washington special number will be assigned by the chief inspector. The installation will be subject to the regular inspections required by WAC 296-104-100 and any additional conditions as required by the board.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 96-21-081, § 296-104-220, filed 10/16/96, effective 11/16/96. Statutory Authority: RCW 70.79.240. 88-01-064 (Order 87-25), § 296-104-220, filed 12/17/87; Part IV, § 5, filed 3/23/60.]

WAC 296-104-230 Construction—New vessels exempted from code requirements for volume, pressure or temperature. Boilers or unfired pressure vessels that are not required by the codes adopted in WAC 296-104-200 to be built to those codes (except those exempted in the RCWs), shall be tested as follows:

One boiler or vessel of each design and size taken from the manufacturer's stock at random, shall be subjected to a hydrostatic test in the presence of an inspector holding a national board commission. The boiler or vessel shall withstand a pressure of 150% of its design pressure without leaks or excessive distortion. Samples shall be taken from the longitudinal seam and tests made as outlined in Section IX ASME Code for root and face bends and reduced tensile coupons. Upon successfully passing the above tests, a maximum allowable working pressure of its design pressure will be allowed for all boilers or vessels constructed to identical specifications. The company name, serial number, working pressure, and energy input (if applicable) shall be stamped or marked in a permanent manner on each boiler or vessel. A retest shall be made at the inspector's discretion or by the request of the chief inspector. Any vessels containing water and an air cushion designed for less than 300 psi and 210 degree F, in use prior to January 1, 1997, may be accepted by hydrostatically testing them to twice their maximum allowable working pressure.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 96-21-081, § 296-104-230, filed 10/16/96, effective 11/16/96; Order 74-37, § 296-104-230, filed 11/8/74; Part IV, § 7, filed 3/23/60.]

WAC 296-104-235 Construction—Boiler and unfired pressure vessel safety relief valves. The boilers and unfired pressure vessels covered by WAC 296-104-230 shall be protected by the installation of ASME Code relief valves with trial levers, set pressure not to exceed the boiler's or the vessel's design pressure. Relief valves shall be installed on top of the boiler or the vessel or on outlet piping as close as possible to the boiler or vessel, with a minimum of fittings and no valves intervening. The outlet of the relief valve shall be run full size to a safe place.

[Title 296 WAC—p. 1933]

[Statutory Authority: RCW 70.79.030 and 70.79.040. 96-21-081, § 296-104-235, filed 10/16/96, effective 11/16/96. Statutory Authority: RCW 70.79.030. 78-03-057 (Order 78-3), § 296-104-235, filed 2/22/78; Part IV, § 8, filed 3/23/60.]

WAC 296-104-240 Construction—Unfired pressure vessels piping components. When a portion of pipe has significant duties other than the transportation of a liquid, gas, or other material; such as storage, catch basin, scrubber, snubber, absorber, or pulsation dampener, it shall be deemed to be an unfired pressure vessel and shall conform to the rules governing the design, construction, inspection, and stamping of unfired pressure vessels.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 96-21-081, § 296-104-240, filed 10/16/96, effective 11/16/96; Part IV, § 9, filed 3/23/60.]

WAC 296-104-245 Construction—Combustible fluid heaters. Steam or hot water combustible fluid heaters shall be so designed and constructed that in the event of failure of any part, the combustible fluid cannot enter the boiler water.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 96-21-081, § 296-104-245, filed 10/16/96, effective 11/16/96. Statutory Authority: RCW 70.79.030. 78-03-057 (Order 78-3), § 296-104-245, filed 2/22/78; Part IV, § 10, filed 3/23/60.]

WAC 296-104-255 Installation—Clearance at top of boilers. When boilers are replaced or new boilers installed in either existing or new buildings, a minimum clearance as specified below shall be provided between the top of boiler proper and ceiling:

(1) Power boilers having a steam generating capacity in excess of 5,000 pounds per hour or having a heating surface in excess of 1,000 sq.ft. or input in excess of 5,000,000 btu per hour. Clearance shall be 7 feet.

(2) Low pressure heating boilers which exceed any one of the following limits: 5,000,000 btu input; 5,000 lbs. steam per hour capacity or 1,000 sq.ft. heating surface; and power boilers which do not exceed any of the following limits: 5,000,000 btu input; 5,000 lbs. steam per hour capacity or 1,000 sq. ft. heating surface; and all boilers with manholes on top of boiler except those described in paragraph (1) above 3 feet.

(3) Low pressure heating boilers which do not exceed the above limits and miniature boilers 2 feet.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 96-21-081, § 296-104-255, filed 10/16/96, effective 11/16/96; Part IV, § 12, filed 3/23/60.]

WAC 296-104-256 Installation—Reinstalled standard boiler or unfired pressure vessel. When a stationary standard boiler or unfired pressure vessel is moved and reinstalled it must be inspected by an inspector. The following will be required:

(1) The fittings and appliances must comply with the latest codes adopted in WAC 296-104-200.

(2) For standard vessels moved to Washington state a complete history of inspection, operation and repairs shall be available for all boilers exceeding 200,000 btu/hr and any pressure vessels exceeding 100 cubic feet.

(3) For any power boiler an evaluation by a Washington state professional engineer or an organization holding a valid ASME Certificate of Authorization is required.

The following are required unless waived by the inspector:

- (a) A hydrostatic test up to 150% of the MAWP.
- (b) Nondestructive testing of any parts.
- (c) An operational test.
- (d) Any repairs deemed necessary.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 96-21-081, § 296-104-256, filed 10/16/96, effective 11/16/96.]

WAC 296-104-260 Installation—Clearance front, back and sides. When boilers are replaced or new boilers installed in either existing or new buildings, minimum clearance shall be provided as specified below:

(1) Minimum clearance at sides and back wall shall be one and one-half feet or at the discretion of the inspector the manufacturers recommended clearances may be used if they allow sufficient room for inspection. Boilers having manholes shall have five feet clearance from the manhole opening and any wall, ceiling, or piping that will prevent a person from entering the boiler.

(2) Clearance in front and back shall be sufficient for operation, maintenance, and repair.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 96-21-081, § 296-104-260, filed 10/16/96, effective 11/16/96. Statutory Authority: Chapter 70.79 RCW. 89-15-025 (Order 89-05), § 296-104-260, filed 7/13/89, effective 8/13/89; Part IV, § 13, filed 3/23/60.]

WAC 296-104-265 Installation—What control and limit devices are required on boilers? (1) Installations prior to June 1989: All automatically fired steam, vapor, or hot water boilers except boilers having a constant attendant who has no other duties while the boiler is in operation, shall be equipped with:

- (a) An automatic low-water fuel cut-off; and
- (b) An automatic water feeding device.
- (c) All devices shall be designed so that they may be readily tested at frequent intervals.

(2) Installations from June 1989 to December 1998:

(a) All boilers that are automatically fired low pressure steam heating boilers, small power boilers, and power steam boilers without a constant attendant who has no other duties shall be equipped with:

(i) Two high steam pressure limit controls, the highest of which shall be provided with a manual reset.

(ii) Two low-water fuel cut-offs, one of which shall be provided with a manual reset device and independent of the feed water controller.

(iii) Coil type flash steam boilers may use two high-temperature limit controls, one of which shall have a manual reset. This is instead of the low-water fuel cut-off.

(iv) All control and limit devices shall be independently connected and electrically wired in series.

(b) All automatically fired hot water supply, low-pressure hot water heating boilers, and power hot water boilers shall be equipped with:

(i) Two high-temperature limit controls, the highest of which shall be provided with a manual reset.

(ii) One low-water fuel cut-off with a manual reset and independent of the feed water controller.

(iii) For coil type hot water boilers a low-water flow limit control installed in the circulating water line may be used instead of a low-water fuel cut-off.

(iv) All control and limit devices shall be independently connected and electrically wired in series.

(3) Installations or refits of gas, oil, or combinations of gas or oil after December 1998: All boilers excluding lined potable water heaters of all BTU input installed or refitted after December 1998, with fuel input ratings of less than 12,500,000 BTU/hr which are fired by gas, oil, or a combination of gas or oil shall comply with the fuel train requirements defined in ASME CSD-1, as adopted in WAC 296-104-200 where applicable.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 98-22-024, § 296-104-265, filed 10/28/98, effective 11/28/98; 97-20-109, § 296-104-265, filed 9/30/97, effective 10/31/97. Statutory Authority: RCW 70.79.240. 88-01-064 (Order 87-25), § 296-104-265, filed 12/17/87; Part IV, § 14, filed 3/23/60.]

WAC 296-104-270 Installation—What are the requirements for an explosion door? Provide substantial deflectors to divert the blast when explosion doors are located within seven feet of the firing floor or an operating platform.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 97-20-109, § 296-104-270, filed 9/30/97, effective 10/31/97; Part IV, § 15, filed 3/23/60.]

WAC 296-104-273 Installation—Pressure vessel clearances. When pressure vessels are replaced or new vessels are installed in either existing or new buildings, a minimum height of eighteen inches shall be provided between the top of the pressure vessel proper and the ceiling and adjacent walls or other structures. All pressure vessels having manholes shall have five feet clearance from manhole openings and any wall, ceiling, or piping that will prevent a person from entering the vessel. Lesser clearances may be acceptable at the discretion of the inspector.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 96-21-081, § 296-104-273, filed 10/16/96, effective 11/16/96.]

WAC 296-104-285 Unfired pressure vessels in places of public assembly. Unfired pressure vessels in places of public assembly shall be exempt from the rules of this chapter when they do not exceed 1 1/2 cubic feet in volume and have a safety valve setting of 150 psi, or less; or when they are less than 6 inches in diameter, and do not exceed 5 cubic feet in volume regardless of pressure.

[Statutory Authority: RCW 70.79.030. 78-03-057 (Order 78-3), § 296-104-285, filed 2/22/78.]

WAC 296-104-300 Installation—When do I need to provide platforms around boilers? Provide platforms allowing safe access to each boiler, when the boiler controls, valves, manholes, or casing openings are over ten feet above the floor.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 97-20-109, § 296-104-300, filed 9/30/97, effective 10/31/97; Part V, § 1, filed 3/23/60.]

WAC 296-104-305 Installation—How many exits are required in boiler rooms? (1) For boiler rooms containing a boiler or a combination of boilers of over 2,000 square feet of

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heating surface, provide at least two exits on opposite sides of the boiler(s).

(2) Each floor elevation change of 10 feet or more must have two exits from that elevation.

(3) All exits shall meet Washington state building codes or local building codes as applicable.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 97-20-109, § 296-104-305, filed 9/30/97, effective 10/31/97; Part V, § 2, filed 3/23/60.]

WAC 296-104-307 Installation—What safety devices are required on boilers and pressure vessels? All boiler and pressure vessels shall be safeguarded by safety valves, safety relief valves, or rupture discs as specified in the ASME Code. As an alternative they may be safeguarded by a fail safe pressure relief control system that is evaluated by a professional engineer licensed by the state of Washington and accepted by the chief inspector.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 98-22-024, § 296-104-307, filed 10/28/98, effective 11/28/98.]

WAC 296-104-310 Installation—Where should the discharge from safety valves, blow offs and drains be directed? Direct the discharge from safety valves, blow offs and drains to prevent injury to personnel or property. Run the discharge line outside the building from single or multiple safety valves on boilers, pressure vessels or headers with a capacity of 5,000 pounds of steam per hour or more.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 98-22-024, § 296-104-310, filed 10/28/98, effective 11/28/98; 97-20-109, § 296-104-310, filed 9/30/97, effective 10/31/97; Part V, § 3, filed 3/23/60.]

WAC 296-104-320 Installation—What are the requirements for underground installations? Where necessary to install a pressure vessel underground:

(1) It shall be enclosed in a concrete or masonry pit.

(2) If covered the cover shall be removable.

(3) A minimum clearance of 18 inches shall be provided between the pressure vessel proper and the ceiling, adjacent walls, or other structures.

(4) All manhole openings shall have a minimum of 5 feet of clearance from any wall, ceiling, or piping that could prevent a person from entering the pit or vessel.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 97-20-109, § 296-104-320, filed 9/30/97, effective 10/31/97; Part V, § 5, filed 3/23/60.]

WAC 296-104-325 Installation—What are the requirements for boiler and pressure vessel supports? Each boiler or unfired pressure vessel shall be supported by masonry or structural supports of sufficient strength and rigidity to safely support the vessel and its contents. There shall be no excessive vibration in either the vessel or its connecting piping.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 97-20-109, § 296-104-325, filed 9/30/97, effective 10/31/97; Part V, § 6, filed 3/23/60.]

WAC 296-104-330 Installation—What are the relief or safety valve requirements when pressure reducing valves are used? (1) Where pressure reducing valves are used, one or more relief or safety valve(s) and pressure gauge(s) shall be provided on the low pressure side of the reducing valve. The relief or safety valve(s) shall be located

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as close as possible to the reducing valve. The combined discharge capacity of the relief valves shall be such that the pressure rating of the lower pressure piping or equipment shall not be exceeded in case the reducing valve sticks open. Discharge lines shall comply with WAC 296-104-310.

(2) The use of hand-controlled bypasses around reducing valves is permissible. The bypass shall not be greater in capacity than the reducing valve unless the piping or equipment is adequately protected by a relief valve(s) or meets the requirements of the high pressure system.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 97-20-109, § 296-104-330, filed 9/30/97, effective 10/31/97; Part V, § 7, filed 3/23/60.]

WAC 296-104-405 Existing installation—How can the maximum allowable working pressure be established for nonstandard boilers or unfired pressure vessels? The maximum allowable working pressure MAWP shall be established as follows:

(1) For nonstandard steel low pressure steam heating boilers the MAWP shall be computed from the formula in subsection (5) of this section not exceeding 15 psi steam.

(2) For nonstandard steel low pressure water heating boilers the MAWP shall be computed from the formula in subsection (5) of this section not exceeding 160 psi.

(3) For nonstandard cast iron low pressure steam heating boilers the MAWP shall not exceed 15 psi steam.

(4) For nonstandard cast iron low pressure water heating boilers the MAWP shall not exceed 30 psi.

(5) For boilers and unfired pressure vessels not listed above, where the original code of construction is unknown, the following formula will be used.

$$\frac{TS \times t \times E}{R \times FS} = MAWP$$

TS = Tensile Strength in psi as given in ASME Code, when material cannot be identified use 55,000 for steel and 45,000 for wrought iron.

t = thickness in inches of the thinnest part determined by actual measurement.

E = efficiency of longitudinal joint or ligament, whichever is the least, determined by the rules and formula in the ASME Code. When construction methods are not known welded joint efficiency will be 70%.

R = radius of largest course in inches.

FS = Factor of Safety, for boilers shall be a minimum of 5. For boilers with a longitudinal lap seam it shall be a minimum 8. Boilers with a longitudinal lap seam, unless granted a special permit, may only be used at a maximum of 15 psi provided they have passed inspection. The minimum for unfired pressure vessels shall be 4 when less than 20 years old, 4 1/2 when over 20 years old.

(6) For miniature hobby boilers the MAWP shall be computed using the formulas referenced in the ASME Code Section I, but the MAWP may not exceed 150 psi. For these formulas the maximum allowable stress (MAS) value shall be 0.75 times the maximum stress at 400 degrees F. in ASME

Code Section II Part D, for listed materials or as set by the department for nonlisted materials.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 98-22-024, § 296-104-405, filed 10/28/98, effective 11/28/98; 97-20-109, § 296-104-405, filed 9/30/97, effective 10/31/97; Part VI, § 2, filed 3/23/60.]

WAC 296-104-502 Repairs—What are the requirements for nonnuclear boilers and pressure vessel repairs and alterations? Repairs and alterations to nonnuclear boilers and pressure vessels shall be made in accordance with the rules of the National Board Inspection Code (NBIC) as adopted in WAC 296-104-102.

Repairs/alterations may be made by:

(1) An organization in possession of a valid Certificate of Authorization for use of the "R" symbol stamp, issued by the National Board provided such repairs/alterations are within the scope of the authorization.

(2) An organization authorized by the chief inspector and in possession of a valid ASME Certificate of Authorization provided such repairs/alterations are within the scope of the organization's Quality Control System. The chief inspector may limit or restrict repairs/alterations for cause.

Owner/user special inspectors may only accept repairs/alterations to unfired pressure vessels operated by their respective companies per RCW 70.79.130.

Where required, reports of welded repairs/alterations, signed by the organization and a commissioned inspector shall be submitted to the department.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 98-22-024, § 296-104-502, filed 10/28/98, effective 11/28/98. Statutory Authority: RCW 70.79.040. 94-21-002, § 296-104-502, filed 10/5/94, effective 11/5/94.]

WAC 296-104-510 Repairs—Do riveted patches require prior approval? Yes, prior to applying riveted patches the design of the patch and method of installation shall be approved by the inspector.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 98-22-024, § 296-104-510, filed 10/28/98, effective 11/28/98; Part VII, § 3, filed 3/23/60.]

WAC 296-104-515 Repairs—What are the requirements for repair of nonnuclear safety devices?

The resetting, repairing, and restamping of safety valves and relief valves shall be done by a qualified manufacturer or valve repair organization holding a valid "V," "UV," or "VR" Certificate of Authorization issued by the National Board of Boiler and Pressure Vessel Inspectors. Section IV safety valves shall be repaired only by the valve manufacturer.

Boiler and pressure vessel users, however, may authorize external adjustments to be made to bring their installed safety valves and relief valves, except Section IV safety valves, back to the stamped set pressure. This adjustment shall be witnessed and approved by a National Board Commissioned Inspector. All such external adjustments shall be resealed showing the identification of the organization making the adjustments and the date.

Repairing of noncode relief or safety valves shall not be allowed, except as specified below. Noncode liquid relief valves installed prior to 1-1-85 shall be repaired by an organization holding a valid "V," "UV," or "VR" Certificate of Authorization, but need not be stamped.

[Statutory Authority: RCW 70.79.030 and 70.79.040, 98-22-024, § 296-104-515, filed 10/28/98, effective 11/28/98. Statutory Authority: RCW 70.79.030, 86-04-059 (Order 86-01), § 296-104-515, filed 2/4/86. Statutory Authority: RCW 70.79.030 and 70.79.330, 84-21-012 (Order 84-20), § 296-104-515, filed 10/5/84; Part VII, § 4, filed 3/23/60.]

WAC 296-104-520 Repairs—When a lap seam crack is discovered along a riveted longitudinal joint what action is required and what repairs are allowed? (1) A "lap seam crack" is a crack found in riveted lap seams, extending parallel to the longitudinal joint and located either between or adjacent to rivet holes.

(2) The shell or drum of any boiler or unfired pressure vessel in which a lap seam crack is discovered along a longitudinal riveted joint shall be immediately discontinued from use.

(3) If the boiler or unfired pressure vessel is not more than 15 years of age, a complete new course of the original thickness may be installed at the discretion of the inspector (and after approval of the chief inspector).

(4) If the boiler or unfired pressure vessel is over 15 years of age the shell or drum of the boiler or unfired pressure vessel shall be replaced.

(5) Patching of a lap seam is prohibited.

[Statutory Authority: RCW 70.79.030 and 70.79.040, 98-22-024, § 296-104-520, filed 10/28/98, effective 11/28/98; Part VII, § 5, filed 3/23/60.]

WAC 296-104-530 Repairs—Can air or vapor testing be performed? Testing by air or vapor at pressures in excess of 15 psig may be performed with special permission from the inspector.

[Statutory Authority: RCW 70.79.030 and 70.79.040, 98-22-024, § 296-104-530, filed 10/28/98, effective 11/28/98. Statutory Authority: RCW 70.79.040, 92-11-070, § 296-104-530, filed 5/20/92, effective 6/20/92; Part VII, § 7, filed 3/23/60.]

WAC 296-104-535 Repairs—What are the requirements for nuclear repairs/replacement? (1) Repairs/replacement to all nuclear components, appurtenances, and their supports shall conform to the rules contained in the ASME Section XI Code. The ASME Section XI Code edition and addenda shall be as specified in the owner in-service inspection program plan.

(2) Where a repair/replacement is performed, a report as required by ASME Section XI Code, signed by the owner and the Authorized Nuclear In-service Inspector (ANII) shall be submitted to the jurisdiction.

[Statutory Authority: RCW 70.79.030 and 70.79.040, 98-22-024, § 296-104-535, filed 10/28/98, effective 11/28/98.]

WAC 296-104-540 Repairs—What are the requirements for nuclear repairs of safety devices? All nuclear components shall be safe-guarded by safety devices, as specified in the ASME Section III Code.

(1) The resetting, repair, and restamping of these safety devices shall be performed only by organizations holding a valid ASME "N" Certificate of Authorization to repair ASME Section III Code safety devices.

(2) Nuclear plant owners with an approved ASME Section XI program, may authorize resetting, repairing or replacement of their safety devices.

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(3) Resetting, repairing or replacement activities shall be witnessed and approved by an inspector, with appropriate National Board endorsements.

(4) All repaired safety devices shall be resealed showing the identification of the organization making the repair and the date.

[Statutory Authority: RCW 70.79.030 and 70.79.040, 98-22-024, § 296-104-540, filed 10/28/98, effective 11/28/98.]

WAC 296-104-700 Inspection fees—Certificate fees—Expenses. The following fees shall be paid by, or on behalf of, the owner or user upon the completion of the inspection. The inspection fees apply to inspections made by inspectors employed by the state.

Heating boilers:	Internal	External
Cast iron—All sizes	26.00	20.80
All other boilers less than 500 sq. ft.	31.20	20.80
500 sq. ft. to 2500 sq. ft.	52.00	26.00
Each additional 2500 sq. ft. of total heating surface, or any portion thereof	20.80	10.40
Power boilers:	Internal	External
Less than 100 sq. ft.	26.00	20.80
100 sq. ft. to less than 500 sq. ft.	31.20	20.80
500 sq. ft. to 2500 sq. ft.	52.00	26.00
Each additional 2500 sq. ft. of total heating surface, or any portion thereof	20.80	10.40
Pressure vessels:		
Automatic utility hot water supply heaters per RCW 70.79.090		5.20
All other pressure vessels: Square feet shall be determined by multiplying the length of the shell by its diameter.		
	Internal	External
Less than 15 sq. ft.	20.80	15.60
15 sq. ft. to less than 50 sq. ft.	31.20	15.60
50 sq. ft. to 100 sq. ft.	36.40	20.80
For each additional 100 sq. ft. or any portion thereof	10.40	36.40
Certificate of inspection fees: For objects inspected, the certificate of inspection fee is \$ 15.60 per object. Nonnuclear shop inspections, field construction inspections, and special inspection services:		
For each hour or part of an hour up to 8 hours		31.20
For each hour or part of an hour in excess of 8 hours		46.80

Nuclear shop inspections, nuclear field construction inspections, and nuclear triennial shop survey and audit:

For each hour or part of an hour up to 8 hours 46.80

For each hour or part of an hour in excess of 8 hours 72.80

Nonnuclear triennial shop survey and audit:

When state is authorized inspection agency:

For each hour or part of an hour up to 8 hours 31.20

For each hour or part of an hour in excess of 8 hours 46.80

When insurance company is authorized inspection agency:

For each hour or part of an hour up to 8 hours 46.80

For each hour or part of an hour in excess of 8 hours 72.80

Expenses shall include:

Travel time and mileage: The department shall charge for its inspectors' travel time from their offices to the inspection sites and return. The travel time shall be charged for at the same rate as that for the inspection, audit, or survey. The department shall also charge the current Washington office of financial management accepted mileage cost fees or the actual cost of purchased transportation. Hotel and meals: Actual cost not to exceed the office of financial management approved rate.

Reinspection fee: Same as the fee for the previous inspection during which discrepancies were reported. The fee will be charged only if the discrepancies are not corrected before the reinspection. The fee shall not exceed \$ 26.00. Washington state specials: For each vessel to be considered by the board for a Washington state special certificate, a fee of \$300.00 must be paid to the department before the board meets to consider the vessel. The board may, at its discretion, prorate the fee when a number of vessels that are essentially the same are to be considered.

[Statutory Authority: RCW 70.79.030 and 70.79.040. 98-09-064, § 296-104-700, filed 4/20/98, effective 5/21/98. Statutory Authority: RCW 70.79.040. 93-12-014, § 296-104-700, filed 5/21/93, effective 6/21/93. Statutory Authority: RCW 70.79.030 and 70.79.330. 84-21-012 (Order 84-20), § 296-104-700, filed 10/5/84; 84-11-016 (Order 84-09), § 296-104-700, filed 5/10/84; 82-24-025 (Order 82-36), § 296-104-700, filed 11/23/82, effective 1/1/83; Order 77-23, § 296-104-700, filed 11/8/77; Emergency Order 77-22, § 296-104-700, filed 11/8/77.]

WAC 296-104-701 Civil penalties. (1) An owner, user, or operator of a boiler or pressure vessel that violates a provision of chapter 70.79 RCW, or of the rules adopted under that

chapter, is liable for a civil penalty based on the following schedule.

Operating under pressure a boiler or pressure vessel which the department has condemned, has issued a red tag or has suspended the inspection certificate:

First offense \$150.00
 Second offense \$300.00
 Each additional offense \$500.00

Each day of such unlawful operation shall be deemed a separate offense.

Operating under pressure a boiler or pressure vessel without a valid inspection certificate:

First offense \$ 50.00
 Second offense \$100.00
 Each additional offense \$200.00

Each day of such unlawful operation shall be deemed a separate offense.

Installation of a boiler or pressure vessel without meeting prior filing requirements of WAC 296-104-020:

First offense \$100.00
 Second offense \$200.00
 Each additional offense \$500.00

Performing a repair to a boiler or pressure vessel, involving welding to a pressure retaining part, without meeting requirements of WAC 296-104-500:

First offense \$150.00
 Second offense \$300.00
 Each additional offense \$500.00

Performing an alteration to a boiler or pressure vessel without meeting requirements of WAC 296-104-501:

First offense \$150.00
 Second offense \$300.00
 Each additional offense \$500.00

Performing resetting, repair or restamping of safety valves, safety relief valves, or rupture discs, without meeting requirements of WAC 296-104-515:

First offense \$150.00
 Second offense \$300.00
 Each additional offense \$500.00

Failure of owner to notify chief inspector in case of accident which serves to render a boiler or unfired pressure vessel inoperative, as required by WAC 296-104-025:

Each offense \$100.00

Failure to comply with a noncompliance report requirement:

Within 90 days \$100.00
 Within 91-180 days \$250.00
 Within 181-270 days \$400.00
 Within 271-360 days \$500.00

(2) The department shall by certified mail notify a person of its determination that the person has violated this section.

(3) Any person aggrieved by an order or act under the boiler and unfired pressure vessels law or under the rules and regulations may, within fifteen days after such order or act, appeal to the board of boiler rules.

(4) Each day that a violation occurs will be a separate offense. A violation will be a second or additional offense only if it occurs within one year from the first violation.

[Statutory Authority: Chapter 70.79 RCW. 87-12-003 (Order 87-10), § 296-104-701, filed 5/21/87.]

Chapter 296-115 WAC

SAFETY REQUIREMENTS FOR CHARTER BOATS

WAC

296-115-001	Foreword.
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296-115-015	Definitions applicable to all sections of this chapter.
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296-115-120	Annual fee schedule.

WAC 296-115-001 Foreword. This chapter is adopted to implement chapter 88.04 RCW as revised in 1979. The purpose of these rules is to set reasonable guidelines and requirements to provide for the safety and health of passengers and crew on board passenger vessels. It is intended that these rules will be at least as effective as the rules adopted by the United States Coast Guard. This chapter is therefore adopted in cooperation with the United States Coast Guard.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-001, filed 11/13/80.]

WAC 296-115-005 Scope and application. (1) This chapter shall apply to vessels for hire that carry seven or more passengers when the vessels are operated in inland waters within the jurisdiction of the state of Washington. These rules shall not apply to vessels in the navigable waters of the United States subject to the jurisdiction of the United States Coast Guard.

(2) Pursuant to chapter 88.04 RCW, the director of the department of labor and industries shall administer this chapter. The director is authorized to use the services of the marine dock section to administer this chapter.

(3) All rules adopted by the United States Coast Guard pertaining to inland water passenger vessel service and navigation on inland waters shall be directly applicable and administered as a part of this chapter unless they conflict with specific provisions of this chapter or chapter 88.04 RCW.

(4) Special consideration. In applying the provisions of this section, the director may allow departures from the specific requirements when special circumstances or arrangements warrant such departures. (46 CFR 175.25-1)

(5) The provisions of this chapter shall not apply to:

(a) A vessel that is a charter boat but is being used by the documented or registered owner of the charter boat exclusively for the owner's own noncommercial or personal pleasure purposes;

(b) A vessel owned by a person or corporate entity which is donated and used by a person or nonprofit organization to transport passengers for charitable or noncommercial purposes, regardless of whether consideration is directly or indirectly paid to the owner;

(c) A vessel that is rented, leased, or hired by an operator to transport passengers for noncommercial or personal pleasure purposes;

(d) A vessel used exclusively for, or incidental to, an educational purpose; or

(e) A bare boat charter boat.

[Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-115-005, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-115-005, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-005, filed 11/13/80.]

WAC 296-115-010 Appeal of decisions. (1) Any person aggrieved by a decision of the marine dock section may appeal the decision to the director within fifteen working days after receipt of the decision.

(2) The director shall give the chief of the marine and dock section notice of the appeal and shall give the chief ten working days to comment in writing. At the discretion of the director, an informal conference may be held with all affected parties invited to participate.

(3) The director shall issue a determining order within twenty working days of the receipt of the appeal or within ten working days following conclusion of an informal conference.

[Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-115-010, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-010, filed 11/13/80.]

WAC 296-115-015 Definitions applicable to all sections of this chapter.

Note: Meaning of words. Unless the context indicates otherwise, words used in this chapter shall have the meaning given in this section.

"Approved" - approved by the director; however, if a provision of this chapter states that approval by an agency or organization other than the department such as nationally recognized testing laboratories or the United States Coast Guard is required, then approval by the specified authority shall be accepted.

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

"Bare boat" charter means the unconditional lease, rental, or charter of a boat by the owner, or his or her agent, to a person who by written agreement, or contract, assumes all responsibility and liability for the operation, navigation, and provisioning of the boat during the term of the agreement or contract, except when a captain or crew is required or provided by the owner or owner's agents to be hired by the charterer to operate the vessel.

"Carrying passengers or cargo" means the transporting of any person or persons or cargo on a vessel for a fee or other consideration.

"CFR" - Code of Federal Regulations.

"Charter boat" means a vessel or barge operating on inland navigable waters of the state of Washington which is not inspected or licensed by the United States Coast Guard and over which the United States Coast Guard does not exercise jurisdiction and which is rented, leased, or chartered to carry more than six persons or cargo.

"Commercial" - any activity from which the operator, or the person chartering, renting, or leasing a vessel derives a profit, and/or which qualifies as a legitimate business expense under the Internal Revenue Statutes.

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

"Confined space" - means a space that:

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

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

(3) Is not designed for continuous employee occupancy.

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

"Department" - the department of labor and industries.

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

"Employer" - any person, firm, corporation, partnership, business trust, legal representative, or other business entity that operates a passenger vessel for hire in this state and employs one or more employees or contracts with one or more persons, the essence of which is the personal labor of such persons. Any person, partnership, or business entity that has no employees, and is covered by the Industrial Insurance Act shall be considered both an employer and an employee.

"Enclosed space" - means any space, other than a confined space, which is enclosed by bulkheads and overhead. It includes cargo holds, tanks, quarters, and machinery and boiler spaces.

"Equipment" means a system, part, or component of a vessel as originally manufactured, or a system, part, or component manufactured or sold for replacement, repair, or improvement of a system, part, or component of a vessel; an accessory or equipment for, or appurtenance to a vessel; or a marine safety article, accessory, or equipment, including radio equipment, intended for use by a person on board a vessel.

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

"Hazardous substance" - a substance that, because it is explosive, flammable, poisonous, corrosive, oxidizing, irritating, or otherwise harmful, is likely to cause death or injury, including all substances listed on the USCG hazardous materials list.

"Inspection" - the examination of vessels by the director or an authorized representative of the director.

"Marine and dock section" - the chief and staff of the marine and dock section, department of labor and industries.

"Passenger" - any person or persons, carried on board a vessel in consideration of the payment of a fee or other consideration.

"Port" - left hand side of a vessel as one faces the bow.

"Starboard" - right hand side of a vessel as one faces the bow.

"Power driven vessel" - any vessel propelled by machinery.

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

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

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

"Shall" - the provision of the standard is mandatory.

"Should" - recommended.

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

"Standard safeguard" - a device intended to remove a hazard incidental to the machine, appliance, tool, or equipment to which the device is attached.

Standard safeguards shall be constructed of either metal, wood, other suitable material, or a combination of these. The final determination of the sufficiency of any safeguard rests with the director.

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

"Under way" - a vessel is not at anchor, or made fast to the shore, or aground.

"USCG" - United States Coast Guard.

"United States Coast Guard Navigation" - rules International/Inland, Commandants Instruction M16672.29 as now adopted, or hereafter legally amended by the United States Coast Guard.

"Vessel" means every description of motorized watercraft, other than a bare boat charter boat, seaplane, or sailboat, used or capable of being used to transport more than six passengers or cargo on water for rent, lease, or hire.

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

"Worker," "personnel," "man," "person," "employee," and other terms of like meaning, unless the context indicates otherwise - an employee of an employer who is employed in the business of his/her employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an

independent contract the essence of which is his/her personal labor for an employer whether by manual labor or otherwise.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-115-015, filed 1/18/95, effective 3/1/95; 91-24-017 (Order 91-07), § 296-115-015, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-115-015, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-015, filed 11/13/80.]

WAC 296-115-025 Vessel inspection and licensing.

(1) The department shall inspect all vessels to ensure they are safe and seaworthy at least once each year. The department may also inspect a vessel if requested to do so by the owner, operator, or master of the vessel, and after an explosion, fire, or any other accident involving the vessel.

(2) The department may inspect a vessel upon receipt of a complaint from any person or, in the discretion of the department, at any other time.

(3) The department shall charge the owner of a vessel a fee for each certification or recertification inspection. This fee shall be determined by the director. (See WAC 296-115-120 for fee schedule.)

(4) After the department has inspected a vessel and it is satisfied the vessel is safe and seaworthy, the department shall issue a certificate of inspection for that vessel. The certificate shall be valid for one year after the date of inspection.

(5) The certificate shall set forth the date of the inspection, the names of the vessel and the owner, the number of lifeboats and life preservers required, the number of passengers allowed, and any other information the department may by rule require.

(6)(a) If at any time a vessel is found to be not safe or seaworthy, or not in compliance with the provisions of this chapter, the department may refuse to issue a certificate of inspection until the deficiencies have been corrected and may cancel any certificate of inspection currently issued.

(b) The department shall give the owner of the vessel a written statement of the reasons the vessel was found to be unsafe, unseaworthy, or not in compliance with the provisions of this chapter, including a specific reference to the statute or rule with which the vessel did not comply.

(7) An inspector of the department may, upon the presentation of his or her credentials to the owner, master, operator, or agent in charge of a vessel, board the vessel without delay to make an inspection. The inspector shall inform the owner, master, operator, or agent in charge that his or her intent is to inspect the vessel.

(8) During the inspection, the inspector shall have access to all areas of the vessel. The inspector may question privately the owner, master, operator, or agent in charge of the vessel, or any crew member of or passenger on the vessel.

(9) If any person refuses to allow an inspector to board a vessel for an inspection, or refuses to allow access to any areas of the vessel, the department may request a warrant from the superior court for the county in which the vessel is located. The court shall grant the warrant:

(a) If there is evidence that the vessel has sustained a fire, explosion, unintentional grounding, or has been involved in any other accident;

(b) If there is evidence that the vessel is not safe or seaworthy; or

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(c) Upon a showing that the inspection furthers a general administrative plan for enforcing the safety requirements of the act.

(10) The owner or master of a vessel shall post the certificate of inspection behind glass in a conspicuous area of the vessel.

(11) No person shall operate a passenger vessel if the vessel does not have a valid certificate of inspection.

[Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-115-025, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-025, filed 11/13/80.]

WAC 296-115-030 Master's examination and licensing.

(1) The registered owner of passenger vessels or barges for hire is responsible to obtain an operator's license from the United States Coast Guard or the department for the master or operator of each vessel. A physical examination will be required.

(2) The department shall penalize any person who acts as a master or operator on a vessel without having first received a United States Coast Guard or department license, or without having a valid license in his or her possession, or upon a vessel or class of vessels not specified in the license.

(3) The department may recommend suspension or revocation of a license to the United States Coast Guard for intemperance, incompetency, or a negligent, reckless, or willful disregard for duty.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-115-030, filed 10/10/89, effective 11/24/89. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-030, filed 11/13/80.]

WAC 296-115-035 Specific inspection requirements.

(1) Drydocking or hauling out.

Each vessel subject to the provisions in this section shall be drydocked or hauled out at intervals not to exceed twenty-four months and the underwater hull and appendages, propellers, shafting, stern bearings, rudders, through-hull fittings, sea valves and strainers shall be examined to determine that these items are in satisfactory condition. Refer to 46 CFR 176.15.

(2) At the annual inspection the marine dock inspector shall view the vessel afloat and conduct the following tests and inspections of the hull:

(a) Hull exterior and interior, bulkheads, and weather deck.

(b) Examine and test by operation all watertight closures in the hull, decks, and bulkheads.

(c) Inspect all railings and bulwarks and their attachment to the hull.

(d) Inspect weathertight closures above the weather deck and drainage or water from exposed decks and superstructure. Refer to 46 CFR 176.25-5.

(3) At the annual inspection the marine dock inspector shall examine and test the following items:

(a) Main propulsion machinery.

(b) Engine starting system.

(c) Engine control mechanisms.

(d) Auxiliary machinery.

(e) Fuel systems.

(f) Sea valves and bulkhead closure valves.

(g) Bilge and drainage systems.

(h) Electrical system, including circuit protection. Refer to 46 CFR 176.25-10 and 176.25-15.

(4) Lifesaving and fire extinguishing equipment. At each annual inspection the marine dock inspector shall inspect the life saving and fire extinguishing equipment for serviceability. Refer to 46 CFR 176.25-20 and 176.25-25.

(5) Miscellaneous systems and equipment. At each annual inspection the marine dock inspector shall inspect and test the vessel's steering apparatus, ground tackle, navigation lights, sanitary facilities, pressure vessels, and any other equipment aboard the vessel for serviceability and safety. Refer to 46 CFR 176.25-35, 176.25-40, and 176.25-45.

[Statutory Authority: Chapter 49.17 RCW, 91-03-044 (Order 90-18), § 296-115-035, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW, 80-17-014 (Order 80-20), § 296-115-035, filed 11/13/80.]

WAC 296-115-040 Construction and arrangement.

(1) Application.

(a) The requirements of this section shall apply to all vessels contracted for construction on or after June 7, 1979.

(b) Vessels constructed before the effective date of this chapter shall be brought into substantial compliance with the requirements of this section. Where deviation exists and strict compliance is impractical, the director may grant a temporary variance to allow a modification or a permanent variance if the intent of subsection (1)(c) of this section is met.

(c) The intent of the regulations in this part is to provide for a sound, seaworthy vessel, reasonably fit for the service it is intended to provide, and to ensure that the materials, scantlings, fastenings, and workmanship meet this intent. Primary consideration shall be given to the provision of a seaworthy hull, protection against fire, means of escape in case of casualty, guards and rails in hazardous places, ventilation of closed spaces, and necessary facilities for passengers and crew.

(2) Hull structure.

(a) In general, compliance with the standards of the United States Coast Guard rules for small passenger vessels or with the standards of a recognized classification society will be considered satisfactory evidence of the structural adequacy of a vessel. Refer to 46 CFR 177.10.

(b) Special consideration will be given by the director to materials or structural requirements not contemplated by the standards of a recognized classification society.

(3) Watertight integrity and subdivision.

(a) All vessels carrying more than forty-nine passengers shall have a collision bulkhead and watertight bulkheads (or sufficient air tankage or other internal flotation) so the vessel will remain afloat (with positive stability) with any one main compartment flooded.

(b) All watertight bulkheads required by this part shall be of substantial construction so as to be able to remain watertight with water to the top of the bulkhead.

(c) Watertight bulkheads shall extend intact to the bulkhead deck. Penetrations shall be kept to a minimum and shall be watertight.

(d) The weather deck on a flush deck vessel shall be watertight and shall not obstruct overboard drainage.

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(e) Cockpits shall be watertight except that companionways may be fitted if they are provided with watertight coamings and weathertight doors. Also, ventilation openings may be provided if they are situated as high in the cockpit as possible and the opening height does not exceed two inches.

(f) Cockpits shall be self-bailing. The scuppers installed for this purpose shall be located so as to be effective considering probable list and trim.

(g) Well decks shall be watertight. Freeing ports may be installed if the provisions of 46 CFR 178.30 are followed.

(h) On vessels operating on protected waters, hatches may be weathertight. All hatches shall be provided with covers capable of being secured.

(i) The number of openings in the vessel's sides below the weather deck shall be kept to a minimum.

(j) Any openings in a vessel's sides, such as portlights, shall comply with 46 CFR 178.40.

(4) Stability.

(a) All vessels subject to the provisions of this section shall have a stability test, except that the director may dispense with the requirements for a test if he deems that a test is not required, on the basis of sufficient evidence provided by the owner that the vessel's stability is satisfactory for the service for which it is intended. Refer to 46 CFR 179.05-1.

(b) A letter stating that the vessel has met the stability requirements of this part shall be posted in the pilothouse of each vessel. Refer to 46 CFR 179.20.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW, 80-17-014 (Order 80-20), § 296-115-040, filed 11/13/80.]

WAC 296-115-050 General requirements. (1) Application.

(a) The following rules are applicable to all vessels operated within the scope of this chapter.

(b) Where an existing vessel does not comply with a particular requirement of this section, the director may grant a temporary variance to allow time for modifications to be made.

(c) Where an existing vessel does not exactly comply with a specific requirement contained herein but the degree of protection afforded is judged to be adequate for the service in which the vessel is used, the director may grant a permanent variance.

(2) Lifesaving equipment. Where equipment required by this section is required to be of an approved type, the equipment is required to be approved by the USCG. Refer to 46 CFR 180.05.

(3) Lifesaving equipment required.

(a) All vessels carrying passengers shall carry life floats or buoyant apparatus for all persons on board.

(b) All life floats or buoyant apparatus shall be international orange in color.

(c) In the case of vessels operating not more than one mile from land, the director may permit operation with reduced amounts of life floats or buoyant apparatus, when, in his opinion, it is safe to do so.

(d) Lifeboats, life rafts, dinghies, dories, skiffs, or similar type craft maybe substituted for the required life floats or buoyant apparatus if the substitution is approved by the director.

(e) Life floats, buoyant apparatus, or any authorized substitute shall have the following equipment:

(i) A life line around the sides at least equivalent to 3/8-inch manila, festooned in bights of at least three feet, with a seine float in the center of each bight.

(ii) Two paddles or oars not less than four feet in length.

(iii) A painter of at least thirty feet in length and of at least two-inch manila or the equivalent. Refer to 46 CFR 180.10.

(f) All vessels shall have an approved adult type life preserver for each person carried, with at least ten percent additional of a type suitable for children.

(g) Life preservers shall be stowed in readily accessible places in the upper part of the vessel, and each life preserver shall be marked with the vessel's name. Refer to 46 CFR 180.25.

(h) All vessels shall carry at least one life ring buoy of an approved type with sixty feet of line attached.

(i) The life ring buoy shall be carried in a readily accessible location and shall be capable of being cast loose at any time. Refer to 46 CFR 180.30.

(4) Fire protection.

(a) The general construction of a vessel shall minimize fire hazards. Refer to 46 CFR 177.10-5.

(b) Internal combustion engine exhausts, boiler and galley uptakes, and similar sources of ignition shall be kept clear of and suitably insulated from woodwork or other combustible material.

(c) Lamp, paint, and oil lockers and similar storage areas for flammable or combustible liquids shall be constructed of metal or lined with metal.

(5) Fire protection equipment. Equipment required by this section, when required to be of an approved type, shall be of a type approved by the USCG or other agency acceptable to the director. Refer to 46 CFR 181.05.

(6) Fire pumps.

(a) All vessels carrying more than forty-nine passengers shall carry an approved power fire pump, and all other vessels shall carry an approved hand fire pump. These pumps shall be provided with a suitable suction and discharge hose. These pumps may also serve as bilge pumps.

(b) Vessels required to have a power fire pump shall also have a fire main system, including fire main, hydrants, hose, and nozzles. The fire hose may be a good commercial grade garden hose of not less than 5/8 inch size. Refer to 46 CFR 181.10.

(7) Fixed fire extinguishing system.

(a) All vessels powered by internal combustion engines using gasoline or other fuel having a flashpoint of 110°F or lower, shall have a fixed fire extinguishing system to protect the machinery and fuel tank spaces.

(b) This system shall be an approved type using carbon dioxide and have a capacity sufficient to protect the space.

(c) Controls for the fixed system shall be installed in an accessible location outside the space protected. Refer to 46 CFR 181.20.

(8) Fire axe. All vessels shall have one fire axe located in or near the pilothouse. Refer to 46 CFR 181.35-1.

(9) Portable fire extinguishers.

(a) All vessels shall have a minimum number of portable fire extinguishers of an approved type. The number required shall be determined by the director.

(b) Portable fire extinguishers shall be inspected at least once a month. Extinguishers found defective shall be serviced or replaced.

(c) Portable fire extinguishers shall be serviced at least once a year. The required service shall consist of discharging and recharging foam and dry chemical extinguishers and weighing and inspecting carbon dioxide extinguishers.

(d) Portable fire extinguishers shall be hydrostatically tested at intervals not to exceed those specified in WAC 296-24-59007 (4)(c) and Table L-3.

(e) Portable fire extinguishers of the vaporizing liquid type such as carbon tetrachloride and other toxic vaporizing liquids are prohibited and shall not be carried on any vessel.

(f) Portable fire extinguishers shall be mounted in brackets or hangers near the space protected. The location shall be marked in a manner satisfactory to the director. Refer to 46 CFR 181.30.

(10) Means of escape.

(a) Except as otherwise provided in this section, all vessels shall be provided with not less than two avenues of escape from all general areas accessible to the passengers or where the crew may be quartered or normally employed. The avenues shall be located so that if one is not available the other may be. At least one of the avenues should be independent of watertight doors.

(b) Where the length of the compartment is less than twelve feet, one vertical means of escape will be acceptable under the following conditions:

(i) There is no source of fire in the space, such as a galley stove or heater and the vertical escape is remote from the engine and fuel tank space; or

(ii) The arrangement is such that the installation of two means of escape does not materially improve the safety of the vessel or those aboard.

(11) Ventilation.

(a) All enclosed spaces within the vessel shall be properly vented or ventilated. Where such openings would endanger the vessel under adverse weather conditions, means shall be provided to close them.

(b) All crew and passenger space shall be adequately ventilated in a manner suitable to the purpose of the space. Refer to 46 CFR 117.20-5.

(12) Crew and passenger accommodations.

(a) Vessels with crew members living aboard shall have suitable accommodations.

(b) Vessels carrying passengers shall have fixed seating for the maximum number of passengers permitted to be carried.

(c) Fixed seating shall be installed with spacing to provide for ready escape in case of fire or other casualty.

(d) Fixed seating shall be installed as follows, except that special consideration may be given by the director if escape over the side can be readily through windows or other openings in the way of the seats:

(i) Aisles not over fifteen feet long shall be not less than twenty-four inches wide.

(ii) Aisles over fifteen feet long shall be not less than thirty inches wide.

(iii) Where seats are in rows the distance from seat front to seat front shall be not less than thirty inches.

(e) Portable or temporary seating may be installed but shall be arranged in general as provided for fixed seating. Refer to 46 CFR 177.25 and 177.30.

(13) Toilet facilities and drinking water.

(a) Vessels shall be provided with toilets and wash basins as specified in WAC 296-24-12007 and 296-24-12009, except that in the case of vessels used exclusively on short runs of approximately thirty minutes or less, the director may approve other arrangements.

(b) All toilets and wash basins shall be fitted with adequate plumbing. Facilities for men and women shall be in separate compartments, except in the case of vessels carrying forty-nine passengers and less, the director may approve other arrangements.

(c) Potable drinking water shall be provided for all passengers and crew. The provisions of WAC 296-24-12005 shall apply.

(d) Covered trash containers shall be provided in passenger areas. Refer to 46 CFR 177.30-5 and 7.

(14) Rails and guards.

(a) Except as otherwise provided in this section, rails or equivalent protection shall be installed near the periphery of all weather decks accessible to passengers and crews. Where space limitations make deck rails impractical, such as at narrow catwalks in the way of deckhouse sides, hand grabs may be substituted.

(b) Rails shall consist of evenly spaced courses. The spacing shall not be greater than twelve inches except as provided in subdivision (f) of this subsection. The lower rail courses may not be required where all or part of the space below the upper rail course is fitted with a bulwark, chain link fencing, wire mesh or the equivalent.

(c) On passenger decks of vessels engaged in ferry or excursion type operation, rails shall be at least forty-two inches high. The top rail shall be pipe, wire, chain, or wood and shall withstand at least two hundred pounds of side loading. The space below the top rail shall be fitted with bulwarks, chain link fencing, wire mesh, or the equivalent.

(d) On vessels in other than passenger service, the rails shall be not less than thirty-six inches high, except that where vessels are used in special service, the director may approve other arrangements, but in no case less than thirty inches.

(e) Suitable storm rails or hand grabs shall be installed where necessary in all passageways, at deckhouse sides, and at ladders and hatches where passengers or crew might have normal access.

(f) Suitable covers, guards, or rails shall be installed in the way of all exposed and hazardous places such as gears or machinery. (See WAC 296-24-150 for detailed requirements.) Refer to 46 CFR 177.3.

(15) Machinery installation. (Refer to 46 CFR 182.)

(a) Propulsion machinery. (Refer to 46 CFR 182.05.)

(i) Propulsion machinery shall be suitable in type and design for the propulsion requirements of the hull in which it is installed. Installations meeting the requirements of the

USCG or other classification society will be considered acceptable to the director.

(ii) Installations using gasoline as a fuel shall meet the requirements of 46 CFR 182.15.

(iii) Installations using diesel fuel shall meet the requirements of 46 CFR 182.20.

(b) Auxiliary machinery and bilge systems. (Refer to 46 CFR 182.10 and 182.25.)

(i) All vessels shall be provided with a suitable bilge pump, piping and valves for removing water from the vessel.

(ii) Vessels carrying more than forty-nine passengers shall have a power operated bilge pump. The source of power shall be independent of the propulsion machinery. Other vessels shall have a hand operated bilge pump, but may have a power operated pump if it is operated by an independent power source.

(c) Steering apparatus and miscellaneous systems. (Refer to 46 CFR 182.30.)

(i) All vessels shall be provided with a suitable steering apparatus.

(ii) All vessels shall be provided with navigation lights and shapes, whistles, fog horns, and fog bells as required by law and regulation.

(iii) All vessels shall be equipped with a suitable number of portable battery lights.

(d) Electrical installations. The electrical installations of all vessels shall be at least equal to 46 CFR 183, or as approved by the director.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-050, filed 11/13/80.]

WAC 296-115-060 Operations. (1) This section shall apply to all passenger vessel operations within the scope of this chapter.

(2) No person shall rent, lease, or hire out a charter boat, nor carry, advertise for the carrying of, nor arrange for the carrying of, more than six passengers on a vessel for a fee or other consideration on the inland navigable waters of the state unless: The vessel is in compliance with the provisions of this chapter.

(3) Notice of casualty. (Refer to 46 CFR 185.15.)

(a) The owner or person in charge of any vessel involved in a marine accident or casualty involving any of the following shall report the incident immediately to the department.

(i) Damage to property in excess of one thousand five hundred dollars.

(ii) Major damage affecting the seaworthiness or safety of the vessel.

(iii) Loss of life or an injury to a person that incapacitates the person for more than seventy-two hours.

(b) The report shall be in writing to the director and upon receipt of the report the director may request an investigation by a marine dock inspector.

(4) Miscellaneous operating requirements. (Refer to 46 CFR 185.20.)

(a) In the case of collision, accident, or other casualty involving a vessel the operator, shall, so far as he can do so without serious danger to his own vessel or persons aboard, render any necessary assistance to other persons affected by the collision, accident, or casualty to save them from danger.

He shall also give his name and address and the name of his vessel to any person injured and to the owner of any property damaged.

(b) The person in charge of the vessel shall see that the provisions of the certificate of inspection are strictly adhered to. This shall not be construed as limiting the person in charge from taking any action in an emergency that he deems necessary to help vessels in distress or to prevent loss of life.

(c) Persons operating vessels shall comply with the provisions of the USCG rules of the road for inland waters. (Refer to USCG publication 169.)

(d) The operator of a vessel shall test the vessel's steering gear, signaling whistle, controls, and communication system before getting under way for the day's operation.

(e) Vessels using fuel having a flashpoint of 110°F or lower shall not take on fuel when passengers are on board.

(f) All vessels shall enforce "no smoking" provisions when fueling. Locations on the vessel where flammable or combustible liquids are stored shall be posted "no smoking."

(g) All vessels shall prepare and post emergency check-off lists in a conspicuous place accessible to crew and passengers, covering the following:

(i) Man overboard.

(ii) Fire.

(h) The persons in charge shall conduct emergency drills to ensure that the crew is familiar with their duties in an emergency.

(i) The carriage of hazardous substances is prohibited on vessels. However, the director may authorize a vessel to carry specific types and quantities of hazardous substances if he deems it necessary.

(j) All areas accessible to passengers or crew shall be kept in a clean and sanitary condition. All walking surfaces shall be free of slipping or tripping hazards and in good repair.

(5) First-aid training. There shall be present or available on all passenger vessels at all times, a person holding a valid certificate of first-aid training.

(6) Valid certification shall be achieved by passing a course of first-aid instruction and participation in practical application of the following subject matter.

Bleeding control and bandaging.

Practical methods of artificial respiration, including mouth to mouth and mouth to nose resuscitation.

Closed chest heart massage.

Poisons.

Shock, unconsciousness, stroke.

Burns, scalds.

Sunstroke, heat exhaustion.

Frostbite, freezing, hypothermia.

Strains, sprains, hernias.

Fractures, dislocations.

Proper transportation of the injured.

Bites, stings.

Subjects covering specific health hazards likely to be encountered by co-workers of first-aid students enrolled in the course.

(7) First-aid equipment. A first-aid kit or first-aid room shall be provided on all passenger vessels. The size and quantity of first-aid supplies or equipment required shall be deter-

mined by the number of persons normally dependent upon each kit or equipment. The first-aid kit or supplies shall be in a weatherproof container with individually sealed packages for each type of item. The first-aid station or kit location shall be posted or on the container.

[Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-115-060, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-060, filed 11/13/80.]

WAC 296-115-070 Rules of navigation. The operation and navigation of all vessels subject to this chapter shall be in strict accordance with the United States Coast Guard Navigation Rules International/Inland, Commandants Instruction M16672.29 as now adopted, or hereafter legally amended by the United States Coast Guard.

(1) A copy of the United States Coast Guard Navigation Rules International/Inland, Commandants Instruction M16672.29, shall be on board all vessels subject to this chapter at all times when the vessel is under way.

(2) At least annually, where applicable, the operator of each vessel shall "swing the vessel" to determine the actual compass readings in relation to true compass headings, and shall maintain a record on board the vessel.

[Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-115-070, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-070, filed 11/13/80.]

WAC 296-115-100 Violations and setting of penalties.

(1) Violations of the mandatory provisions of this chapter shall be subject to penalty. The amount of the penalty will be assessed in accordance with the guidelines and fixed schedules contained herein.

(2) Fixed schedule penalties.

(a) Failure to display certificate of inspection as required: Fifty dollars to owner of the vessel.

(b) Operation of vessel in passenger service without a valid certificate of inspection: To owner of vessel, two hundred dollars per violation; to person who operates vessel, one hundred dollars per violation.

(c) Operation of vessel in passenger service while not in possession of valid USCG/state of Washington operator's license: One hundred dollars per violation to owner of vessel.

[Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-115-100, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-100, filed 11/13/80.]

WAC 296-115-120 Annual fee schedule. (1) The annual license fee for passenger vessels or barges is \$250.00 plus \$2.00 per ton for each vessel.

(2) The fee for an operator's license for passenger vessels or barges is \$50.00 for the first year; this covers application and test costs. The renewal fee is \$25.00 annually.

(3) Additional inspection service when required is at the rate of \$25.00 per hour, plus travel and per diem.

[Statutory Authority: Chapter 49.17 RCW. 89-21-018 (Order 89-10), § 296-115-120, filed 10/10/89, effective 11/24/89. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-115-120, filed 11/13/80.]

Chapter 296-125 WAC

NONAGRICULTURAL EMPLOYMENT OF MINORS

WAC

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DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-125-020	Minor work permits. [Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060. 93-01-068, § 296-125-020, filed 12/1/92, effective 3/1/93; Order 76-15, § 296-125-020, filed 5/17/76; Order 71-5, § 296-125-020, filed 5/26/71, effective 7/1/71; Section C, filed 9/18/63; Rules (part), filed 3/23/60.] Repealed by 99-02-041, filed 12/31/98, effective 1/31/99. Statutory Authority: RCW 49.12.121.
296-125-023	Posting. [Order 76-15, § 296-125-023, filed 5/17/76.] Repealed by 93-01-068, filed 12/1/92, effective 3/1/93. Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060.
296-125-025	Conditions governing issuance of permits. [Order 74-9, § 296-125-025, filed 3/13/74, effective 4/15/74; Order 71-5, § 296-125-025, filed 5/26/71, effective 7/1/71; Section D, filed 9/18/63; Rules (part), filed 3/12/60.] Repealed by Order 76-15, filed 5/17/76.
296-125-026	Parent/school authorization forms. [Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060. 93-01-068, § 296-125-026, filed 12/1/92, effective 3/1/93.] Repealed by 99-02-041, filed 12/31/98, effective 1/31/99. Statutory Authority: RCW 49.12.121.
296-125-028	Meal and rest breaks for minors. [Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060. 93-01-068, § 296-125-028, filed 12/1/92, effective 3/1/93.] Repealed by 99-02-041, filed 12/31/98, effective 1/31/99. Statutory Authority: RCW 49.12.121.
296-125-035	Working conditions. [Section F, filed 9/18/63; Rules (part), filed 3/23/60.] Repealed by Order 71-5, filed 5/26/71, effective 7/1/71.
296-125-040	Issuance of permit. [Order 71-5, § 296-125-040, filed 5/26/71, effective 7/1/71; Section G, filed 9/18/63; Rules (part), filed 3/23/60.] Repealed by Order 76-15, filed 5/17/76.
296-125-045	Denial of permit. [Order 71-5, § 296-125-045, filed 5/26/71, effective 7/1/71; Section H, filed 9/18/63.] Repealed by Order 76-15, filed 5/17/76.
296-125-050	Posting, recordkeeping, and authority to enter, inspect, and investigate. [Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060. 93-01-068, § 296-125-050, filed 12/1/92, effective 3/1/93; Order 76-15, § 296-125-050, filed 5/17/76; Order 71-5, § 296-125-050, filed 5/26/71, effective 7/1/71; Section I, filed 9/18/63; Rules (part), filed 3/23/60.] Repealed by

- 99-02-041, filed 12/31/98, effective 1/31/99. Statutory Authority: RCW 49.12.121.
- 296-125-055 Revocation of permits. [Order 76-15, § 296-125-055, filed 5/17/76; Order 71-5, § 296-125-055, filed 5/26/71, effective 7/1/71; Section J, filed 9/18/63; Rules (part), filed 3/23/60.] Repealed by 93-01-068, filed 12/11/92, effective 3/1/93. Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060.
- 296-125-060 Variances. [Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060. 93-01-068, § 296-125-060, filed 12/11/92, effective 3/1/93; Order 76-15, § 296-125-060, filed 5/17/76.] Repealed by 99-02-041, filed 12/31/98, effective 1/31/99. Statutory Authority: RCW 49.12.121.
- 296-125-070 Special variances. [Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060. 93-01-068 and 93-04-112, § 296-125-070, filed 12/11/92 and 2/3/93, effective 3/1/93 and 7/1/93.] Repealed by 99-02-041, filed 12/31/98, effective 1/31/99. Statutory Authority: RCW 49.12.121.
- 296-125-110 Applicability. [Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-110, filed 11/3/89, effective 11/20/89.] Repealed by 93-01-068, filed 12/11/92, effective 3/1/93. Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060.
- 296-125-115 Definitions. [Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-115, filed 11/3/89, effective 11/20/89.] Repealed by 93-01-068, filed 12/11/92, effective 3/1/93. Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060.
- 296-125-120 Filing of registration certificate. [Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-120, filed 11/3/89, effective 11/20/89.] Repealed by 93-01-068, filed 12/11/92, effective 3/1/93. Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060.
- 296-125-125 Application for initial and renewed registration. [Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-125, filed 11/3/89, effective 11/20/89.] Repealed by 93-01-068, filed 12/11/92, effective 3/1/93. Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060.
- 296-125-130 Posting. [Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-130, filed 11/3/89, effective 11/20/89.] Repealed by 93-01-068, filed 12/11/92, effective 3/1/93. Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060.
- 296-125-135 Identification cards. [Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-135, filed 11/3/89, effective 11/20/89.] Repealed by 93-01-068, filed 12/11/92, effective 3/1/93. Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060.
- 296-125-140 House to house employment standards. [Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-140, filed 11/3/89, effective 11/20/89.] Repealed by 93-01-068, filed 12/11/92, effective 3/1/93. Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060.
- 296-125-145 Transporting minors out-of-state. [Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-145, filed 11/3/89, effective 11/20/89.] Repealed by 93-01-068, filed 12/11/92, effective 3/1/93. Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060.
- 296-125-155 Recordkeeping. [Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-155, filed 11/3/89, effective 11/20/89.] Repealed by 93-01-068, filed 12/11/92, effective 3/1/93. Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060.
- 296-125-160 Revocation of registration certificate. [Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-160, filed 11/3/89, effective 11/20/89.] Repealed by 93-01-068, filed 12/11/92, effective 3/1/93. Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060.
- 296-125-165 Denial of registration certificate. [Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-165, filed 11/3/89, effective 11/20/89.] Repealed by 93-01-068, filed 12/11/92, effective 3/1/93. Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060.
- 296-125-170 Employment of minors under the age of sixteen. [Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-170, filed 11/3/89, effective 11/20/89.] Repealed by 93-01-068, filed 12/11/92, effective 3/1/93. Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060.
- 296-125-175 Length of registration period. [Statutory Authority: RCW 43.22.270 and 1989 c 216. 89-23-003, § 296-125-175, filed 11/3/89, effective 11/20/89.] Repealed by 93-01-068, filed 12/11/92, effective 3/1/93. Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060.

WAC 296-125-010 Applicability. This chapter applies to every person that employs one or more minors, or who permits, allows, or suffers one or more minors to work at a site or workplace, on premises, or under work conditions controlled by that employer, except for those employers statutorily exempted, as follows: This chapter does not apply to newspaper vendors or carriers; to domestic or casual labor in or about private residences; to parents or stepparents who employ their own children for house-to-house sales; to agricultural labor as defined by RCW 50.04.150; or, to employers expressly exempted by federal statute from the coverage of state law.

[Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060. 93-01-068, § 296-125-010, filed 12/11/92, effective 3/1/93; Order 76-15, § 296-125-010, filed 5/17/76; Order 74-9, § 296-125-010, filed 3/13/74, effective 4/15/74; Order 71-5, § 296-125-010, filed 5/26/71, effective 7/1/71; Section A, filed 9/18/63; Rules (part), filed 3/23/60.]

WAC 296-125-015 Definitions. For the purposes of this chapter:

(1) "Department" means the Washington state department of labor and industries.

(2) "Employ" means to engage, suffer or permit to work, and includes entering into any arrangement, including a contract, whether implied, express, oral, or written, with a minor whereby the minor works in house-to-house sales except when a minor is working in house-to-house sales for her or his parent or stepparent. The term "employ" does not include newspaper vendors or carriers, the use of domestic or casual labor in or about private residences, agricultural labor as defined by RCW 50.04.150, or the use of voluntary or donated services performed for an educational, charitable, religious, or nonprofit organization and without expectation or contemplation of compensation for the services performed.

(3) "Employee" means any minor employed by an employer, including minors who work pursuant to any arrangement, including contract, whether implied, express, oral, or written in house-to-house sales, but does not include newspaper vendors or carriers, domestic or casual labor in or about private residences, minors employed in agricultural labor as defined by RCW 50.04.150, or minors employed for house-to-house sales by their parents or stepparents.

(4) "Employer" means any person, association, partnership, private or public corporation that employs or exercises control over the wages, hours, working conditions, or workplace of a minor, and for purposes of house-to-house sales includes any distributor or other person, association, partnership, private or public corporation that enters into any arrangement, including contract, whether implied, express,

oral, or written, with a minor whereby the minor works in house-to-house sales; but does not include employers of agricultural labor as defined by RCW 50.04.150, employers of newspaper vendors or carriers, employers of casual labor in or about the employers' private residences, parents or step-parents employing their own minor children for house-to-house sales, the state, a state institution, a state agency, a political subdivision of the state, a municipal corporation, or a quasi-municipal corporation.

(5) "House-to-house sales" means a sale or other transaction in consumer goods, the demonstration of products or equipment, the obtaining of orders for consumer goods, or the obtaining of contracts for services, in which an employee personally solicits the sale or transaction at a place other than the place of business of the employer or the residence of the employee.

(6) "Minor" means a person under the age of eighteen years.

(7) "School holiday" means a day of a school week on which the school at which a minor employee is enrolled is scheduled to be closed. If a minor employee is not enrolled in school, school holidays shall be determined by the schedule of the public school district in which the minor resides.

(8) "School vacation" means the spring break, winter break, and summer break of the school at which a minor employee is enrolled, or if not enrolled the public school district in which a minor resides.

(9) "Transport" means the conveyance, provision of a means of conveyance, or reimbursement or payment for the cost of conveyance at the direction or under the control of an employer or an employer's agent.

(10) "Workplace" means any worksite, premises, or location where minors work.

[Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060, 93-01-068, § 296-125-015, filed 12/11/92, effective 3/1/93. Statutory Authority: RCW 43.22.270 and 1989 c 216, 89-23-003, § 296-125-015, filed 11/3/89, effective 11/20/89; Order 76-15, § 296-125-015, filed 5/17/76; Order 74-9, § 296-125-015, filed 3/13/74, effective 4/15/74; Order 71-5, § 296-125-015, filed 5/26/71, effective 7/1/71; Section B, filed 9/18/63; Rules (part), filed 3/23/60.]

WAC 296-125-018 Minimum age for employment. (1)

Pursuant to RCW 26.28.060, a written order issued by a judge of a superior court of the county in which a minor lives is a prerequisite to the hiring, not otherwise prohibited by federal law, of any minor under the age of fourteen for any labor in or in connection with any store, shop, factory, mine, or inside employment other than inside employment connected with farm or housework.

(2) No employer shall employ a minor under the age of sixteen in house-to-house sales, unless the department has granted a variance to an employer for that specific purpose.

[Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060, 93-01-068, § 296-125-018, filed 12/11/92, effective 3/1/93.]

WAC 296-125-019 Prerequisites to employing minors. Prior to hiring a minor or allowing a minor to work, an employer that seeks to employ one or more minors must:

(1) Obtain, maintain, and post a valid minor work permit from the department of labor and industries for each work-

place at which minors will be employed, pursuant to WAC 296-125-020.

(2) If employing minors for house-to-house sales:

(a) Obtain and maintain a valid house-to-house sales registration certificate from the department of labor and industries, pursuant to WAC 296-125-024, in addition to a minor work permit, and in addition to parent/school authorization forms pursuant to WAC 296-125-026 (see subsection (3) of this section);

(b) If the employer seeks to transport a minor out of the state of Washington for house-to-house sales, obtain and keep on file express written authorization from each minor's parent or legal guardian to transport each minor worker out of the state for house-to-house sales;

(c) Obtain from the department and issue valid identification cards with photographs for each minor employee, pursuant to WAC 296-125-024.

(3) Obtain and keep on file at the minor's workplace(s) a completed parent/school authorization form for each minor, pursuant to WAC 296-125-026. In the case of minors employed for house-to-house sales, the forms shall be kept on file at the employer's primary place of business within the state of Washington.

(4) Keep on file at the minor's workplace(s) any variances issued pursuant to WAC 296-125-060 or 296-125-070.

[Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060, 93-01-068, § 296-125-019, filed 12/11/92, effective 3/1/93.]

MASTER BUSINESS LICENSE/MINOR WORK PERMIT ENDORSEMENT

WAC 296-125-0200 If I plan to employ minors in my business, what general requirements do I have to satisfy?

(1) You must obtain, keep current and post valid minor work permit endorsements issued by the department.

(2) If employing minors for house-to-house sales, you must satisfy the special requirements in WAC 296-125-024 for that activity.

(3) You must obtain and keep on file a completed parent/school authorization form for each minor you employ.

(4) You must keep on file any variances issued to you according to variance and/or special variance sections of this chapter.

(5) If you sponsor bona fide *unpaid* work-based learning programs approved by the office of the superintendent of public instruction or a local school district, you are not required to obtain minor work permit endorsements for those programs.

[Statutory Authority: RCW 49.12.121, 99-02-041, § 296-125-0200, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0210 Do I need minor work permit endorsements for my business? If you plan to employ one or more minors, you must obtain, keep current and post valid minor work permit endorsements before you:

(1) Employ minors; or

(2) Allow minors to work at your workplace; or

(3) Allow minors to work under work conditions controlled by you.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0210, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0211 What if I employ minors at several different workplaces? (1) You must obtain, keep current and post separate minor work permit endorsements for each workplace at which you employ minors.

(2) In those situations where you place minors in a workplace controlled by another employer, you and the other employer must obtain, keep current and post minor work permit endorsements at that workplace.

(3) When you employ minors in multiple workplaces, you must obtain, keep current and post minor work permit endorsements at each workplace.

(4) Unless modified or revoked, a single endorsement will allow you to employ any number of minors at the workplace specified on the endorsement.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0211, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0220 Are there working condition restrictions which may be placed on my minor work permit endorsements? Minor work permit endorsements may include restrictions, consistent with this chapter, on minors' working conditions.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0220, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0221 Do my minor work permit endorsements expire? Your minor work permit endorsements will expire one year from the date of issue.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0221, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0222 Can I renew my minor work permit endorsements? You may renew your minor work permit endorsements. However, filing an application for renewal does not automatically result in an extension of your endorsement. The department may refuse to renew your endorsement if you have:

- (1) Failed to satisfy a condition related to the initial issuance of the endorsement; or
- (2) Violated the requirements of this chapter; or
- (3) Any other condition that the department finds is or could be detrimental to the health, safety, or welfare of minors.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0222, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0223 How long must my minor work permit endorsements stay in force? Unless revoked, suspended or modified by the department, your minor work permit endorsements must remain in full force and effect as long as:

- (1) You employ minors; or
- (2) Have minors working at your workplace; or
- (3) Have minors working under work conditions controlled by you.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0223, filed 12/31/98, effective 1/31/99.]

(1999 Ed.)

WAC 296-125-0224 Do I need to post my minor work permit endorsements? At least one copy of your minor work permit endorsements and a current copy of the poster required by WAC 296-126-080 must be posted in plain view of all employees at each workplace specified in each endorsement.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0224, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0230 Can the department of labor and industries refuse to issue or renew, revoke, suspend or modify my minor work permit endorsements? The department may refuse to issue or renew, revoke, suspend, or modify your minor work permit endorsements if it finds:

- (1) A condition related to their issuance has not been satisfied; or
- (2) You have violated any requirements of this chapter; or

(3) An existing condition that is or could be detrimental to the health, safety, or welfare of a minor. In this case, the department may issue an order of immediate restraint revoking, suspending or modifying your endorsements. If you appeal the department's action, the order of immediate restraint will remain in force until your appeal is resolved.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0230, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0231 Can I appeal the department's refusal to issue or renew, or to revoke, suspend or modify my minor work permit endorsements? You have the right to appeal such actions by the department. However, your appeal must be filed with the department in writing within thirty days of the department's action according to the procedures established by RCW 49.12.161 and 49.12.400. Your appeal *will not* set aside an order of immediate restraint issued by the department according to RCW 49.12.390.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0231, filed 12/31/98, effective 1/31/99.]

WAC 296-125-024 House-to-house sales. (1) Minimum age. No minor under the age of sixteen years may be employed in house-to-house sales, unless the department grants a variance to an employer for that specific purpose. A variance must be obtained prior to an employer's employment of any minor under the age of sixteen.

(2) Registration certificates. Each employer of minors in house-to-house sales, or person seeking to advertise to employ a person in house-to-house sales with an advertisement specifically stating a minimum age requirement that is under the age of twenty-one, shall receive from the department, and shall maintain, a valid house-to-house sales registration certificate prior to employing a sixteen- or seventeen-year-old minor for house-to-house sales and prior to advertising for employment.

Employers also must obtain and maintain a valid minor work permit, pursuant to WAC 296-125-020, and parent/school authorization forms, pursuant to WAC 296-125-126, prior to employing minors for house-to-house sales. If an employer seeks to transport a minor out of the state of Washington for house-to-house sales, the employer must obtain and keep on file express written authorization from

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each minor's parent or legal guardian to transport each minor worker out of the state for house-to-house sales.

A valid registration certificate and a valid minor work permit must remain in full force and effect at all times that minors are employed by the employer. When duly issued by the department, and unless modified, suspended, or revoked, such a certificate will authorize the employer to employ any number of sixteen- or seventeen-year-old minors for house-to-house sales in accordance with the provisions of this chapter and in accordance with any limitations listed on the certificate.

(3) Adult supervision requirements.

(a) The employer shall ensure that there is one adult supervisor for every five minor employees employed in house-to-house sales during all work hours. A supervisor may not supervise more than one group of five minor employees.

(b) The employer shall ensure that each supervisor of minor employees is a responsible adult who is at least twenty-one years of age.

(c) The employer shall ensure that each supervisor has contact, personally or verbally, with each minor employee at least once every fifteen minutes. The contact with minor employees may be made by remote means such as telephone or walkie-talkie, but in any case shall be of such a nature as to provide assurance of the minor's health, safety, and welfare. The employer shall ensure that each supervisor is within one-half mile of each supervised minor employee during all working hours.

(d) The employer shall ensure that each minor employee is returned by the employer or its agent to the minor's home or initial point of contact promptly at the end of the minor's work hours. If the minor is returned to the initial point of contact, the employer shall ensure that the location selected is one in which the minor's safety is the first and foremost consideration. Minors shall be protected from risks of injury including, but not limited to, moving vehicles.

(4) Hours restrictions and rest periods. Minors may not be employed in house-to-house sales prior to 7:00 a.m. or after 9:00 p.m., nor during school hours. In addition, employers of minors in house-to-house sales must comply with the further requirements of WAC 296-125-027, concerning maximum number of hours per day and per week, and WAC 296-125-028, concerning mandatory rest and meal breaks.

(5) Employee identification cards.

(a) An employer shall issue to each minor employed in house-to-house sales an identification card with the employee's picture. The identification cards issued shall be exclusively from forms obtained in blank from the department.

(b) An identification card shall be in the possession of each minor employed in house-to-house sales during all working hours, and shall be shown to each customer or potential customer.

(6) Posting. At least one copy of a valid house-to-house sales registration certificate shall be posted in plain view of all employees at the employer's primary place of business within the state of Washington.

(7) Renewal. House-to-house sales registration certificates shall be valid for a one-year period. The filing of an

application for renewal of registration does not result in an automatic extension of the one-year registration period. The department may refuse to renew a registration certificate if the department finds that a condition of the previous registration period has not been satisfied, that the employer has violated the requirements of this chapter, or that any other condition exists that is or could be detrimental to the health, safety, or welfare of a minor.

(8) Revocation, suspension, and modification. The department may revoke, suspend, or modify an employer's registration for house-to-house sales if the department finds that a condition of registration is not being satisfied, that the employer has violated the requirements of this chapter, or that any other condition exists which is or could be detrimental to the health, safety, or welfare of a minor. In the event the department finds that a condition exists which is or could be detrimental to the health, safety, or welfare of a minor, the department may take emergency action to revoke or suspend a house-to-house sales registration; in such instances, an appeal of the department's action shall not stay the revocation, suspension, or modification during the pendency of the appeal.

(9) Appeals. An appeal of an action by the department to refuse to issue or renew, or to revoke, suspend, or modify an employer's house-to-house sales registration must be filed in writing with the director of the department within thirty days of the department's action. Such appeal shall be conducted in accordance with the rules of practice and procedure established in chapter 296-10 WAC. Such appeal shall not stay the effectiveness of an emergency action taken by the department pursuant to this section.

[Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060, 93-01-068, § 296-125-024, filed 12/11/92, effective 3/1/93.]

PARENT/SCHOOL AUTHORIZATION FORMS

WAC 296-125-0260 If I employ minors, do I need authorization from the parent or school? Before allowing a minor to begin work, you must obtain and keep on file, at the minor's workplace, a fully completed parent/school authorization form. As the employer, it is your responsibility to ensure that the parent/school authorization form is complete.

[Statutory Authority: RCW 49.12.121, 99-02-041, § 296-125-0260, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0261 Where can I obtain a parent/school authorization form? Parent/school authorization forms are issued only to employers with a valid minor work permit endorsement and can be obtained by contacting the local labor and industries office or:

Department of Labor and Industries
Employment Standards Section
PO Box 44510
Olympia WA 98504-4510

[Statutory Authority: RCW 49.12.121, 99-02-041, § 296-125-0261, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0262 Do parent/school authorization forms expire? All parent/school authorization forms expire

each year on the thirtieth day of September. *Therefore, each year, prior to September 30, you must:*

- (1) Obtain a new form for each of your minors; and
- (2) Make sure it is properly completed; and
- (3) File it where the minor works.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0262, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0263 What information must a minor provide on the parent/school authorization form? A minor must provide the following personal information:

- (1) Name.
- (2) Address.
- (3) Date of birth*.
- (4) Whether he or she is employed at any other job(s) and the total number of hours worked at that job(s).
- (5) His or her signature.

*Note: The date of birth must be supported by proof. Acceptable forms of proof are:

- A birth certificate and a social security card; or
- A driver's license; or
- A baptismal record and a Social Security card; or
- A notarized statement of a parent or guardian.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0263, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0264 What information must an employer provide on the parent/school authorization form? As the employer, you must provide the following information:

- (1) The location of the minor's workplace(s).
- (2) A description of the minor's duties.
- (3) The earliest and latest hours the minor would be working.
- (4) The total number of hours the minor would work per week.
- (5) Your minor work permit endorsement number and expiration date.
- (6) Your unified business identifier (UBI) number.
- (7) Your signature or the signature of your authorized agent.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0264, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0265 What information must a parent or legal guardian provide on the parent/school authorization form? A parent or legal guardian of a minor must:

- (1) Indicate that he or she authorizes (or does not authorize) the minor to work according to the terms listed by the employer.
- (2) Sign the form.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0265, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0266 What information must a school provide on the parent/school authorization form? (1) If a minor will be working during the school year, an authorized school official from the minor's school must:

- (a) Indicate that the school authorizes (or does not authorize) the minor working according to the terms listed by the employer; and
- (b) Sign the form as the school's authorized agent.

(1999 Ed.)

(2) Furthermore, if a minor begins work during a school vacation and wishes to continue working after school resumes, the employer must obtain school approval before the minor can continue. School approval must be based upon:

- (a) Maintaining an acceptable level of scholastic achievement; and
- (b) Maintaining good school attendance; and
- (c) Making satisfactory progress toward graduation.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0266, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0267 What if a minor is no longer attending school? (1) A parent or guardian must certify a minor's nonenrolled status if the minor is:

- (a) Unmarried and living with a parent or legal guardian; and
- (b) No longer enrolled in school; and
- (c) Has not obtained a certificate of educational competence according to RCW 28A.305.190 or is not enrolled in a bona fide college program.

(2) If a minor is named on a valid marriage certificate or is living independently of a parent or legal guardian, the minor must:

- (a) Certify that he or she is either married or living independently of a parent or guardian; and
- (b) Certify his or her nonenrolled status; and
- (c) Provide the name and location of the last school attended; and
- (d) Provide the name and address or telephone number of an adult emergency contact other than the minor's employer. This contact person must certify that the minor is living independently of a parent or legal guardian.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0267, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0268 Can a parent, legal guardian or school revoke the work authorization previously given on the parent/school authorization form? A parent, legal guardian, or school may revoke authorization at any time by simply notifying the department and the other parties to the authorization.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0268, filed 12/31/98, effective 1/31/99.]

WAC 296-125-027 Hours of work for minors. Employers shall restrict the hours of minors' employment as follows:

- (1) During the school year:
 - (a) Minors may work the following total of hours:
 - (i) Minors under the age of sixteen:
 - (A) Maximum of three hours per day on any school day preceding another school day or otherwise a maximum of eight hours per day;
 - (B) Maximum of six days per week; and
 - (C) Maximum of sixteen hours per week;
 - (D) Except that no minors of this age shall work in house-to-house sales without a variance issued by the department pursuant to WAC 296-125-060(7).
 - (ii) Sixteen- and seventeen-year-old minors:

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(A) Maximum of four hours per day on any school day preceding another school day or otherwise a maximum of eight hours per day;

(B) Maximum of six days per week; and

(C) Maximum of twenty hours per week.

(b) Minors shall work during the following hours only:

(i) Minors under the age of sixteen:

(A) No earlier than 7:00 a.m.;

(B) No later than 7:00 p.m. on any day preceding a school day;

(C) No later than 9:00 p.m. on Fridays, Saturdays, and the day preceding a school holiday or vacation, provided that minors employed past 8:00 p.m. in service occupations shall be supervised by a responsible adult employee who is on the premises at all times; and

(D) Not during school hours;

(E) Except that minors of this age shall not be employed in house-to-house sales without a variance issued by the department pursuant to WAC 296-125-060(7).

(ii) Sixteen- and seventeen-year-old minors:

(A) No earlier than 7:00 a.m.;

(B) No later than 10:00 p.m. on any day preceding a school day;

(C) No later than 12:00 a.m. on Fridays, Saturdays, and the day preceding a school holiday or vacation, provided that minors employed past 8:00 p.m. in service occupations shall be supervised by a responsible adult employee who is on the premises at all times; and

(D) Not during school hours, unless the minor has been excused from school attendance by the minor's school district superintendent or her or his authorized agent.

(2) During school vacations:

(a) Minors may work the following total of hours:

(i) Minors under the age of sixteen:

(A) Maximum of eight hours per day;

(B) Maximum of six days per week; and

(C) Maximum of forty hours per week;

(D) Except that no minors of this age shall work in house-to-house sales without a variance issued by the department pursuant to WAC 296-125-060(7).

(ii) Sixteen- and seventeen-year-old minors:

(A) Maximum of eight hours per day;

(B) Maximum of six days per week; and

(C) Maximum of forty-eight hours per week.

(b) Minors shall work during the following hours only:

(i) Minors under the age of sixteen:

(A) No earlier than 7:00 a.m.; and

(B) No later than 9:00 p.m. provided that minors employed past 8:00 p.m. in service occupations shall be supervised by a responsible adult employee who is on the premises at all times.

(ii) Sixteen- and seventeen-year-old minors:

(A) No earlier than 5:00 a.m.; and

(B) No later than 12:00 a.m. provided that minors employed past 8:00 p.m. in service occupations shall be supervised by a responsible adult employee who is on the premises at all times, and except no later than 9:00 p.m. for minors employed in house-to-house sales.

(3) Sixteen- and seventeen-year-old minors who have been issued a certificate of educational competence pursuant

to RCW 28A.305.190, are enrolled in a bona fide college program, are named on a valid certificate of marriage, or are shown as the parent on a valid certificate of birth may work as would be permitted during school vacations.

[Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060 and chapters 49.12 and 43.22 RCW and RCW 43.17.060, 93-01-068 and 93-01-116, § 296-125-027, filed 12/11/92 and 12/21/92, effective 7/1/93; Order 76-15, § 296-125-027, filed 5/17/76.]

RECORDKEEPING

WAC 296-125-0275 When I employ minors, what recordkeeping requirements must I satisfy? (1) You must create and maintain a file for each minor.

(2) The file must be maintained for three years from the last date of the minor's employment.

(3) The file must contain the following:

(a) A copy of the completed parent/school authorization form with any attachments; and

(b) Copies of any variances you obtained according the requirements of this chapter.

(4) These records must be kept safe and accessible at the place of employment or at a central recordkeeping office where such records are customarily maintained.

[Statutory Authority: RCW 49.12.121, 99-02-041, § 296-125-0275, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0280 What is the department's enforcement authority? To enforce the requirements of this chapter, the director or the director's authorized representatives can, without delay:

(1) Enter any workplace where work is or has been performed by a minor, or where employment records are, or are required to be maintained; and

(2) Inspect, transcribe, and copy all pertinent records; and

(3) Inspect and investigate any workplace and all pertinent conditions, structures, machines, apparatus, devices, equipment, supplies, and materials located there; and

(4) Question privately any employer, owner, operator, agent, or employee.

[Statutory Authority: RCW 49.12.121, 99-02-041, § 296-125-0280, filed 12/31/98, effective 1/31/99.]

MEAL AND REST BREAKS FOR MINORS

WAC 296-125-0285 What regulations apply to meal and rest breaks for my fourteen-year-old and fifteen-year-old minors? (1) Since the purpose of meal periods and rest breaks is to provide rest from work, they must not be scheduled near the beginning of the work shift.

(2) The following specific regulations apply to your minors who are *fourteen-years-old and fifteen-years-old*:

(a) They must not work more than four hours without being given a meal period. This meal period must be at least thirty minutes in length and be separate and distinct from, and in addition to, the rest breaks mandated by this subsection.

(b) They must be given, on your business's time, a rest break of at least ten minutes for every two hours worked.

(c) When they work four-hour periods, they cannot be required to work more than two hours without being given either a ten-minute rest break or a thirty-minute meal period.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0285, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0287 What regulations apply to meal and rest breaks for my sixteen-year-old and seventeen-year-old employees? (1) The following regulations apply to *meal periods* for your minors who are *sixteen-years-old and seventeen-years-old*:

(a) They must be allowed meal periods of at least thirty minutes in length.

(b) Their meal periods must start no less than two hours but no more than five hours from the beginning of their work shift.

(c) They must not be required to work more than five consecutive hours without a meal period.

(2) The following regulations apply to *rest periods* for your minors who are *sixteen-years-old and seventeen-years-old*:

(a) They must be allowed a rest period of not less than ten minutes, on your time, for each four hours worked.

(b) Their rest periods must be scheduled as near as possible to the midpoint of the work period.

(c) They must receive a rest period at least every three hours.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0287, filed 12/31/98, effective 1/31/99.]

WAC 296-125-030 Prohibited and hazardous employment—All minors. The following employments and occupations as outlined in subsections (1) through (30) of this section, are prohibited for all minors, provided that exemption will be allowed from subsections (5), (8), (9), (11), (13), (15), (16), and (23) of this section when the minor is participating in a bona fide cooperative vocational education program, diversified career experience program, or work experience program certified and monitored by the office of the superintendent of public instruction or the minor employee's school district; further, exemption from the same numbered prohibitions will be allowed for any minor involved in an apprenticeship program registered with the Washington state apprenticeship and training council. The state will not grant variances for employments or occupations prohibited by the United States Department of Labor.

(1) Occupations in or about plants or establishments manufacturing or storing explosives or articles containing explosive components.

(2) Occupations involving regular driving of motor vehicles. Occupations of outside helper or flagger on any public road or highway, work which involves directing moving motor vehicles in or around warehouses or loading/unloading areas including but not limited to loading docks, transfer stations, or landfills, or work which involves towing vehicles. Occasional driving is permissible if: The minor has a valid state driver's license for the type of driving involved; driving is restricted to daylight hours; such driving is only occasional, and is incidental to the minor's employment; vehicle gross weight is under 6,000 pounds; the minor has completed

a state-approved driver education course; and seat belts are provided in the vehicle and the minor has been instructed to use them. Occupations involving occasional operation of a bus are prohibited.

(3) All mining occupations.

(4) Logging occupations and occupations in the operation of any sawmill, lath mill, shingle mill, or cooperage-stock mill.

(5) Occupations involving operation or repair, oiling, cleaning, adjusting, or setting up of any power-driven wood-working machines.

(6) Occupations involving potential exposure to radioactive substances and to ionizing radiation.

(7) Occupations involving operation or repair, oiling, cleaning, adjusting, or setting up of elevators. This includes riding on a manlift.

(8) Occupations involving operation or repair, oiling, cleaning, adjusting, or setting up of power-driven metal-forming, punching, and shearing machines.

(9) Occupations involving slaughtering, meat packing, processing, or rendering.

(10) Occupations involving operation or repair, oiling, cleaning, adjusting, or setting up of power-driven bakery machines.

(11) Occupations involving operation or repair, oiling, cleaning, adjusting, or setting up of power-driven paper-products machines.

(12) Occupations involving manufacturing of brick, tile, and kindred products.

(13) Occupations involving operation or repair, oiling, cleaning, adjusting, or setting up of power-driven circular saws, band saws, and guillotine shears.

(14) Occupations involving wrecking, demolition, and shipbreaking operations.

(15) All roofing operations.

(16) Occupations involving excavations.

(17) Occupations involving operation or repair, oiling, cleaning, adjusting, or setting up of or working in proximity to earth-moving machines, hoisting apparatus, cranes, garbage-compactors, trash-compactors or other compactors, paper-balers or other balers, or other heavy equipment including, but not limited to, graders, bulldozers, earth compactors, backhoes, and tractors. Working in proximity shall mean working within the radius of movement of any portion of the machinery where one could be struck or otherwise injured. It shall not include work in proximity to ski-lift apparatus. This prohibition shall not invalidate activities allowed under subsection (2) of this section.

(18) Work in establishments or workplaces being picketed during the course of a labor dispute.

(19) Work as a nurse's aide/assistant; unless the minor is a student in a bona fide state-certified nursing training program or has successfully completed such a program.

(20) Work as a maid or bellhop in motels or hotels, unless the minor is accompanied by a responsible adult whenever the work requires the minor to enter an assigned guest room, whether or not it is occupied at the time the minor is in the room. Minors may work in unassigned, unoccupied guest rooms unaccompanied by an adult.

(21) Work in sauna or massage parlors, body painting or tattoo studios, or adult entertainment establishments.

(22) Occupations requiring the wearing of personal protective equipment or wearing apparel as defined and required by statutes or rules and regulations administered by the department's division of industrial safety and health as related to hazardous substances exposure and/or hazardous noise exposure per chapters 296-24 and 296-62 WAC; except those occupations where the only requirement is the wearing of gloves, boots, or eye protection if the occupation is not otherwise prohibited by this section or by WAC 296-125-033. This subsection's prohibitions shall not apply if a minor is a student in a bona fide health care career training or vocational education program.

(23) Occupations involving fire fighting and fire suppression duties.

(24) Occupations where there is a risk of exposure to bodily fluids or transmission of infectious agents, including but not limited to hepatitis and HIV, in accordance with standards established by WAC 296-62-08001 (Occupational exposure to blood-borne pathogens), including lab work which entails the cleaning of medical equipment used to draw or store blood or other contaminated tissue; duties which involve venipuncture; and duties involving work with laundry from health care facilities; unless the minor is a student in a bona fide health care career training or vocational education program. State-certified life guards with first aid training are exempt.

(25) Occupations involving potential exposure to hazardous substances which are considered to be carcinogenic, corrosive, highly toxic, toxic sensitizers, or which have been determined to cause reproductive health effects or irreversible end organ damage. This does not include handling of such substances in sealed containers in retail situations. This subsection's prohibitions shall not apply to any consumer product or hazardous substance, as those terms are defined by the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and the Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) and those statutes' regulations, where the employer of a minor can demonstrate that a product or substance is used in the workplace in the same manner as normal consumer use, and which use results in a duration and frequency of exposure that is not greater than exposures experienced by consumers using the product or substance in conformity with the manufacturer's instructions, provided that such exposures are not otherwise prohibited by subsection (22) of this section.

(26) In selling to passing motorists on the public right of way candy, flowers, or other merchandise or commodities. Selling to motorists from a window counter is not prohibited.

(27) Work performed in or about boiler or engine rooms.

(28) All work performed more than ten feet above ground or floor level.

(29) Work in freezers, meat coolers, and all work in preparing meats for sale (wrapping, sealing, labeling, weighing, pricing, and stocking are permitted if work is performed away from meat-cutting and preparation areas). Occasional entry into freezers or coolers for obtaining stock or placing stock shall not be prohibited.

(30) Service occupations if a minor works past 8:00 p.m., unless the minor is supervised by a responsible adult employee who is on the premises at all times.

[Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060, 93-01-068, § 296-125-030, filed 12/11/92, effective 3/1/93. Statutory Authority: RCW 43.22.270 and 1989 c 216, 89-23-003, § 296-125-030, filed 11/3/89, effective 11/20/89; Order 77-32, § 296-125-030, filed 12/30/77; Order 76-15, § 296-125-030, filed 5/17/76; Order 74-9, § 296-125-030, filed 3/13/74, effective 4/15/74; Order 71-5, § 296-125-030, filed 5/26/71, effective 7/1/71; Section E, filed 9/18/63; Rules (part), filed 3/23/60.]

WAC 296-125-033 Prohibited and hazardous employment—Special restrictions for minors under the age of 16. Employment of minors under age 16 is subject to the following additional restrictions. They are prohibited from working:

(1) In any manufacturing operations.

(2) In any processing operations (including but not limited to filleting of fish, dressing poultry, cracking nuts, commercial processing, canning, freezing or drying of foods, laundering as performed by commercial laundries and dry cleaning).

(3) In any public messenger service, including but not limited to work that is performed by foot, bicycle, or public transportation.

(4) In occupations connected with transportation, warehouse and storage, communications and public utilities, or construction. (Office work related to these occupations is permitted if none of the minor's work is performed on the transportation media or construction site.)

(5) In the following specific areas of retail, food service or gasoline service station operations:

(a) Maintenance or repair work.

(b) Window washing or other work requiring worker to be positioned at higher than ground or floor level.

(c) Cooking and baking.

(d) Operating, setting up, adjusting, cleaning, oiling or repairing power-driven food slicers and grinders, food choppers and cutters and bakery-type mixers.

(6) In occupations involving work in the operation of amusement parks, street carnivals, and traveling shows.

(7) Loading and unloading goods to or from trucks, railroad cars, or conveyors.

(8) In occupations involving operation or repair, oiling, cleaning, adjusting, or setting up of or working in proximity to any power-driven machinery.

[Statutory Authority: Chapters 43.22 and 49.12 RCW, RCW 26.28.060 and 43.17.060, 93-01-068, § 296-125-033, filed 12/11/92, effective 3/1/93; Order 76-15, § 296-125-033, filed 5/17/76.]

WAC 296-125-043 Minimum wages—Minors. Except where a higher minimum wage is required by Washington state or federal law:

(1) Every employer shall pay to each of his or her employees who have reached their sixteenth or seventeenth year of age a rate of pay per hour which is equal to the hourly rate required by RCW 49.46.020 for employees eighteen years of age or older, whether computed on an hourly, commission, piecework, or other basis, except as may be otherwise provided under this chapter.

(2) Every employer shall pay to each of his or her employees who have not reached their sixteenth year of age a rate of pay per hour that is not less than eighty-five percent of the hourly rate required by RCW 49.46.020 for employees eighteen years of age or older whether computed on an hourly, commission, piecework, or other basis, except as may be otherwise provided under this chapter.

(3) These provisions shall not apply to handicapped minors for whom special handicapped minor work permits have been issued as provided in RCW 49.12.110. The handicapped rate therein shall be set at a rate designed to adequately reflect the individual's earning capacity.

(4) These minimum wage provisions shall not apply when a minor student is in a work place to carry out an occupational training experience assignment directly supervised on the premises by a school official or an employer under contract with a school and when no appreciable benefit is rendered to the employer by the presence of the minor student.

[Statutory Authority: RCW 43.22.270 and 1988 c 236, 89-10-014 (Order 88-32), § 296-125-043, filed 4/24/89, effective 6/1/89; Order 76-15, § 296-125-043, filed 5/17/76.]

VARIANCES

WAC 296-125-0600 What is a variance? A variance is an exception to the rules of this chapter granted for good cause by the director of labor and industries or the director's designee.

[Statutory Authority: RCW 49.12.121, 99-02-041, § 296-125-0600, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0610 How do I obtain a variance? You must submit a written application to the director requesting the variance(s). In your application you must specify the reasons why your request should be granted. If necessary, the director may request or receive additional information from you or other interested parties.

[Statutory Authority: RCW 49.12.121, 99-02-041, § 296-125-0610, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0611 What does "good cause" mean? At a minimum, "good cause" refers to those situations and circumstances that support your request for a variance. You must be able to demonstrate that the variance will not be harmful to the health, safety, and welfare (including school attendance and performance) of the minor(s) affected. "Good cause" may also include the financial need of the minor's family or an exceptional or special talent manifested by the minor.

[Statutory Authority: RCW 49.12.121, 99-02-041, § 296-125-0611, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0620 Are there special requirements that I must satisfy if I request a variance to employ minors under the age of sixteen in house-to-house sales? If you are requesting a variance to employ minors under the age of sixteen in house-to-house sales, you must demonstrate good cause for the variance and file a signed sworn statement ensuring that the following minimum requirements will be in force at all times:

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(1) All house-to-house sales will be conducted only during daylight hours; and

(2) A responsible adult who is at least twenty-one years of age will accompany the minor at all times; and

(3) No house-to-house sales visits will be conducted in inclement weather; and

(4) The minor will only be employed for a specific time period that cannot exceed six weeks.

[Statutory Authority: RCW 49.12.121, 99-02-041, § 296-125-0620, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0640 What criteria will be used to evaluate my variance request? (1) The director or the director's designee may grant your variance request if you:

(a) Possess a valid minor work permit endorsement; and

(b) Demonstrate good cause.

(2) Variances will be granted, as applicable, based on good cause shown, for residential schools, apprenticeship programs registered with the Washington state apprenticeship and training council, and vocational education, diversified career education, work experience, and cooperative education programs accepted and certified by the office of superintendent of public instruction or the local school district for circumstances other than those already exempted in WAC 296-125-030.

(3) Variances from federal regulations will not be issued except where you can show exemption from federal statutes and regulations governing minor work.

[Statutory Authority: RCW 49.12.121, 99-02-041, § 296-125-0640, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0650 Do my variances expire? Each of your variances will expire upon the expiration of the minor work permit endorsement that was in effect at the time the variance was issued unless the variance was issued with an earlier expiration date.

[Statutory Authority: RCW 49.12.121, 99-02-041, § 296-125-0650, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0651 Can my variances be renewed? When you renew your minor work permit endorsements, you must also apply for new variances that are related to those endorsements.

[Statutory Authority: RCW 49.12.121, 99-02-041, § 296-125-0651, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0660 Can the department of labor and industries revoke, suspend, or modify my variances? The department may revoke, suspend, or modify your variances if it finds:

(1) A condition related to its issuance has not been satisfied; or

(2) You have violated any requirement of this chapter; or

(3) An existing condition that is or could be detrimental to the health, safety, or welfare of a minor including an adverse impact upon their school attendance or performance.

[Statutory Authority: RCW 49.12.121, 99-02-041, § 296-125-0660, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0670 Can I appeal the department's action to revoke, suspend or modify my variances? You

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have the right to appeal a department action to revoke, suspend or modify your variances. However, your appeal must be filed with the department in writing within thirty days of the department's action according to the procedures established by RCW 49.12.161 and 49.12.400. Your appeal *will not* set aside an order of immediate restraint issued by the department according to RCW 49.12.390.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0670, filed 12/31/98, effective 1/31/99.]

SPECIAL VARIANCES

WAC 296-125-0700 What is a special variance? (1) A special variance is an exception to specific rules of this chapter. Special variances are granted by a designated school official of a school district or individual private school which has department approval to participate in the special variance process described in WAC 296-125-0720.

(2) A special variance is used to facilitate flexibility in a sixteen-year-old or seventeen-year-old minor's school and work requirements and may be granted *only* for exceptions to the rules governing:

(a) The maximum hours of work per week during a week when school is in session, up to a maximum of twenty-eight hours per week; and

(b) The maximum hours of work per day during a week when school is in session, up to a maximum of six hours per day.

(3) Special variances will not be granted for sixteen-year-old and seventeen-year-old minors working in house-to-house sales.

(4) When school is in session, minors must not work in excess of the maximum hours per week or per day illustrated in the following chart unless the employer has a current, fully completed and executed special variance on file at the minor's workplace.

Hours of work--Nonagriculture

	14-year-olds and 15-year-olds		16-year-olds and 17-year-olds	
	School	Nonschool	School	Nonschool
Hours a day	3* (weekdays)	8	4** (weekdays)	8
	8 (Fri.-Sun.)		8 (Fri.-Sun.)	
Hours a week	16	40	20/28***	48
Days a week	6 days	6 days	6 days	6 days
Start	7 a.m.	7 a.m.	7 a.m.	5 a.m.
Quit	7 p.m. (weekdays)	9 p.m.	10 p.m. (Sun.-Thurs.) Midnight (Fri. & Sat.)	Midnight

* 14-year-olds and 15-year-olds can work up to 3 hours on a school day preceding a school day. All other days, 8 hours per day.

** 16-year-olds and 17-year-olds can work up to 4 hours on a school day preceding a school day. All other days, 8 hours per day.

*** Up to 28 hours available through special variances.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0700, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0710 What criteria will be followed in evaluating my special variance request? The designated school official may grant your special variance request if you:

- (1) Possess a valid minor work permit endorsement; and
- (2) Demonstrate good cause; and
- (3) Request the variance for a minor whose school district or individual private school has department approval to participate in the special variance process discussed in WAC 296-125-0720.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0710, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0720 How can a school district or individual private school qualify for participation in the special variance process? Each school district or individual pri-

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ate school seeking to participate in the special variance process must:

- (1) Complete an enrollment form provided by the department; and
- (2) Be approved by the department; and
- (3) Agree to maintain a mandatory recordkeeping system specified by the department; and
- (4) Use the uniform criteria described in WAC 296-125-0750 to evaluate variance requests.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0720, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0721 Where can a school district or individual private school obtain a copy of the special variance process enrollment form? The form can be obtained from:

Department of Labor and Industries
 Employment Standards Section
 PO Box 44510
 Olympia WA 98504-4510

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0721, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0722 In addition to completing the enrollment form, what other requirements must be satisfied before a school district or private school can partici-

pate in the special variance program? At a minimum, a school district or private school must agree to all of the following:

(1) Maintain the recordkeeping system required by the department.

(2) Designate a school official at each school who is authorized to evaluate and approve/disapprove variance requests.

(3) Use the uniform criteria discussed in WAC 296-125-0750 to evaluate variance requests.

(4) Within thirty days of the school's action, forward a copy of each variance approved or denied to the department.

(5) Give department agents immediate access to all variance files during normal school office hours.

(6) Be responsible for ensuring that the employer completes all appropriate sections of the special variance request form.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0722, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0723 What is the employer's responsibility in providing information to the minor, the minor's parent or legal guardian, and school officials? (1) The employer must obtain a special variance form from the participating school and provide the following information:

(a) The minor's work-related duties;

(b) The maximum hours to be worked each week;

(c) The length of the minor's work shifts;

(d) The latest afternoon or evening hour that the minor will work;

(e) The number of days each week that the minor will be required to work the latest afternoon or evening hour;

(f) The employer's unified business identifier (UBI) number;

(g) The expiration dates of the employer's minor work permit endorsements.

(2) The employer must agree to maintain all special variance records according to the terms of WAC 296-125-0275.

(3) Upon completion, the employer must give the form to the minor to complete according to WAC 296-125-0730.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0723, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0730 What other information about special variance requests is important? (1) To be valid, a special variance request form must be completed and signed by the employer, the minor, the minor's authorized school official and the minor's parent or legal guardian.

(2) The special variance, unless revoked, suspended or modified, shall remain in force for the duration of the school year for which it was granted. While the special variance is in force, it is the school district's responsibility to monitor it to insure that the conditions under which it was granted are being met.

(3) All minors must complete their section of the variance form *after* the employer section has been completed but *before* the form is submitted to the school, parent, or legal guardian.

(4) All minors must explain why they are requesting a special variance.

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(5) The minor's parent or guardian must sign the request form. By signing, the parent or guardian approves or denies the request and attests to the reasons supporting it.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0730, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0740 What are the consequences of submitting an incomplete special variance request form?

(1) An incomplete special variance request form submitted to the department is:

(a) Invalid; and

(b) A violation of this chapter; and

(c) Cause for a school district, an individual private school or an employer to be dropped from the special variance program.

(2) When the department receives an incomplete special variance request form, it must give written notification to the school district or private school that its enrollment in the special variance program is being revoked.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0740, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0741 Can a school district or private school appeal the department's decision to revoke its participation in the special variance program? A school district or private school may appeal a notice of revocation; however, the appeal must be filed with the department in writing within thirty days of its receipt. The written appeal must be sent to the department according to the procedures established by RCW 49.12.161 and 49.12.400. Filing an appeal does not set aside a notice of revocation.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0741, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0750 What are the criteria used by a school to evaluate special variance requests? In evaluating requests for special variances, a school must consider at least the following factors:

(1) Does the employer hold a current valid minor work permit endorsement?

(2) What is the student's attendance pattern?

(3) Is the student making satisfactory academic progress?

(4) Will the student still have opportunities to participate in extracurricular activities?

(5) How many school nights will the student work?

(6) How late in the evening will the student work?

(7) How long a shift will the student work?

(8) How sound is the student's rationale for requesting a variance from the work hour restrictions illustrated in the table in WAC 296-125-0700(4)?

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0750, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0760 Do special variances expire? (1) Since special variances will be issued only to employers holding valid minor work permit endorsements, each special variance expires on the expiration date of the endorsement that was in effect at the time the special variance was issued.

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(2) Upon the renewal of a minor work permit endorsement, an employer must complete a new special variance request form.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0760, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0770 Can the department of labor and industries revoke, suspend, or modify a special variance?

(1) The department may revoke, suspend, or modify a special variance if it finds:

(a) A condition related to its issuance has not been satisfied; or

(b) A violation of any requirement of this chapter; or

(c) An existing condition that is or could be detrimental to the health, safety, or welfare of a minor.

(2) If an employer violates the hour standards in WAC 296-125-027 or the hours specified in any special variance, they will forfeit their participation in the special variance process for one year from the finding of the violation by the department.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0770, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0771 Can the parties to a special variance revoke it? A parent, legal guardian, or school may revoke a special variance at any time by simply giving written notification to the department and the other parties to the variance.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0771, filed 12/31/98, effective 1/31/99.]

WAC 296-125-0772 Can the department's action to refuse to issue or renew, revoke, suspend or modify a special variance be appealed? The department's refusal to issue or renew participation in the special variance process can be appealed, as well as, its decision to revoke or suspend participation. However, the appeal must be filed with the department in writing within thirty days of the department's action according to the procedures established by RCW 49.12.161 and 49.12.400. The appeal *will not* set aside an order of immediate restraint issued by the department according to RCW 49.12.390.

[Statutory Authority: RCW 49.12.121. 99-02-041, § 296-125-0772, filed 12/31/98, effective 1/31/99.]

Chapter 296-126 WAC

STANDARDS OF LABOR FOR THE PROTECTION OF THE SAFETY, HEALTH AND WELFARE OF EMPLOYEES FOR ALL OCCUPATIONS SUBJECT TO CHAPTER 49.12 RCW

WAC

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Reviser's note: For industrial welfare committee appeal procedures, see also chapter 296-129 WAC.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-126-098	Wearing apparel. [Statutory Authority: RCW 49.12.091 (as amended by RCW 43.22.282). 97-01-124, § 296-126-098, filed 12/19/96, effective 1/19/97; Order 76-15, § 296-126-098, filed 5/17/76.] Repealed by 98-14-041, filed 6/24/98, effective 7/25/98. Statutory Authority: RCW 49.12.091 and 1998 c 334.
296-126-140	Appeal procedures. [Order 74-9, § 296-126-140, filed 3/13/74, effective 4/15/74.] Repealed by 97-17-064, filed 8/18/97, effective 9/18/97.
296-126-224	Wearing apparel. [Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-224, filed 2/3/78.] Repealed by 97-01-124, filed 12/19/96, effective 1/19/97. Statutory Authority: RCW 49.12.091 (as amended by RCW 43.22.282).

WAC 296-126-001 Applicability. These standards, adopted pursuant to the authority of chapter 49.12 RCW as amended by chapter 16, Laws of 1973 2nd ex. sess., shall apply to any person employed in any industry or occupation within the state of Washington, unless:

(1) Exempted by the provisions of chapter 49.12 RCW (newspaper vendors or carriers, domestic or casual labor in or about private residences, agricultural labor as defined in RCW 50.04.150, as now or hereafter amended, and sheltered workshops, are all exempt from these provisions);

(2) Otherwise exempted in rules and regulations adopted by the industrial welfare committee of the state of Washington;

(3) Exempted by a variance issued under the provisions in WAC 296-126-130;

(4) Such person is an employee of the state or any political subdivision, or municipal corporation to the extent that these rules conflict with any statute, rule or regulation adopted under the authority of the appropriate legislative body.

[Order 74-9, § 296-126-001, filed 3/13/74, effective 4/15/74.]

WAC 296-126-002 Definitions. (1) "Employer" means any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees, unless exempted by chapter 49.12 RCW or these rules.

(2) "Employee" means an employee who is employed in the business of his employer whether by way of manual labor or otherwise. This definition is not intended, for purposes of these regulations, to include: Any individual registered as a volunteer with a state or federal volunteer program or any person who performs any assigned or authorized duties for an educational, religious, governmental or nonprofit charitable corporation by choice and receives no payment other than reimbursement for actual expenses necessarily incurred in order to perform such volunteer services; any individual employed in a bona fide executive, administrative or professional capacity or in the capacity of commissioned outside salesperson; nor is it intended to include independent contractors where said individuals control the manner of doing the work and the means by which the result is to be accomplished.

(3) "Employ" means to engage, suffer or permit to work.

(4) "Adult" means any person of either sex, eighteen years of age or older.

(5) "Minor" means any person of either sex under eighteen years of age.

(6) "Student learner" means a person enrolled in a bona fide vocational training program accredited by a national or regional accrediting agency recognized by the United States Office of Education, or authorized and approved by the Washington state commission for vocational education, who may be employed part time in a definitely organized plan of instruction.

(7) "Learner" means a worker whose total experience in an authorized learner occupation is less than the period of time allowed as a learning period for that occupation in a learner certificate issued by the director pursuant to regulations of the department of labor and industries.

(8) "Hours worked" shall be considered to mean all hours during which the employee is authorized or required by the employer to be on duty on the employer's premises or at a prescribed work place.

(9) "Conditions of labor" shall mean and include the conditions of rest and meal periods for employees including provisions for personal privacy, practices, methods and means by or through which labor or services are performed by employees and includes bona fide physical qualifications in employment, but shall not include conditions of labor otherwise governed by statutes and rules and regulations relating to industrial safety and health administered by the department.

(10) "Committee" shall mean the industrial welfare committee as provided by law. The committee's secretary is the supervisor of employment standards in care of the Department of Labor and Industries, General Administration Building, Olympia, Washington 98504.

[Order 76-15, § 296-126-002, filed 5/17/76; Order 74-9, § 296-126-002, filed 3/13/74, effective 4/15/74.]

WAC 296-126-010 Minimum wages—Adults. Except where a higher minimum wage is required by Washington state or federal law, (1) every employer shall pay to each of his or her adult employees wages at a rate of not less than one dollar and eighty cents per hour, and effective January 1, 1975, not less than two dollars per hour, whether computed

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on an hourly commission, piecework or other basis, except as may be otherwise provided by law or regulation.

(2) These provisions shall not apply to outside commissioned salespersons; or to trainees, learners, student learners, apprentices or handicapped persons for whom special certificates or special permits have been issued as set forth in RCW 49.12.110. These special rates shall be computed as follows: Learners — 85% of the applicable minimum wage; student-learner — 75% of the applicable minimum rate; handicapped — at a rate designed to reflect adequately the individual's earning capacity.

[Order 74-9, § 296-126-010, filed 3/13/74, effective 4/15/74.]

WAC 296-126-020 Minimum wages—Minors. Except where a higher minimum wage is required by Washington state or federal law:

(1) Every employer shall pay to each of his or her employees who have reached their sixteenth or seventeenth year of age a rate of pay per hour which is equal to the hourly rate required by RCW 49.46.020 for employees eighteen years of age or older, whether computed on an hourly, commission, piecework, or other basis, except as may be otherwise provided under this chapter.

(2) Every employer shall pay to each of his or her employees who have not reached their sixteenth year of age a rate of pay per hour that is not less than eighty-five percent of the hourly rate required by RCW 49.46.020 for employees eighteen years of age or older whether computed on an hourly, commission, piecework, or other basis, except as may be otherwise provided under this chapter.

(3) These provisions shall not apply to handicapped minors for whom special handicapped minor work permits have been issued as provided in RCW 49.12.110. The handicapped rate therein shall be set at a rate designed to adequately reflect the individual's earning capacity.

[Statutory Authority: RCW 43.22.270 and 1988 c 236, 89-10-014 (Order 88-32), § 296-126-020, filed 4/24/89, effective 6/1/89; Order 74-9, § 296-126-020, filed 3/13/74, effective 4/15/74.]

WAC 296-126-021 Minimum wages—Commissions and piecework. Where employees are paid on a commission or piecework basis, wholly or partially, (1) the amount earned on such basis in each work-week period may be credited as a part of the total wage for that period; and

(2) The total wages paid for such period shall be computed on the hours worked in that period resulting in no less than the applicable minimum wage rate.

[Order 74-9, § 296-126-021, filed 3/13/74, effective 4/15/74.]

WAC 296-126-022 Gratuities. For the purposes of these regulations, gratuities received by employees shall not be considered a part of the minimum wage.

[Order 74-9, § 296-126-022, filed 3/13/74, effective 4/15/74.]

WAC 296-126-023 Payment interval. All wages due shall be paid at no longer than monthly intervals to each employee on established regular pay days. To facilitate book-keeping, an employer may implement a regular payroll system in which wages from up to seven days before pay day

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may be withheld from the pay period covered and included in the next pay period.

[Statutory Authority: RCW 43.22.270, 49.12.020, 49.12.091, 49.12.050, 49.46.020 and 49.46.070. 89-22-016 (Order 89-16), § 296-126-023, filed 10/24/89, effective 11/24/89; Order 74-9, § 296-126-023, filed 3/13/74, effective 4/15/74.]

WAC 296-126-025 Deductions. Except as otherwise provided by law, no employer shall make any deduction from the wage of an employee:

(1) For any cash shortage, walkout (failure of customer to pay), breakage, or loss of equipment, unless it can be shown that the shortage, walkout, breakage or loss was caused by a dishonest or willful act of the employee.

(2) For acceptance of a bad check, unless it can be shown that the employee accepted such a check in violation of procedures previously made known to him or her by the employer.

(3) For any cash shortage from a cash register, drawer or portable depository provided for that purpose, unless the employee has sole access to the cash and has participated in the cash accounting at the beginning of his or her shift and again at the end of said shift. Where a portable cash depository is in use the employer shall provide for periodic withdrawals of cash receipts during the shift to prevent large accumulations of cash.

[Order 74-9, § 296-126-025, filed 3/13/74, effective 4/15/74.]

WAC 296-126-040 Statements furnished. Every employer shall furnish to each employee at the time of payment of wages an itemized statement showing the pay basis (i.e., hours or days worked), rate or rates of pay, gross wages and all deductions therefrom for that pay period.

[Order 74-9, § 296-126-040, filed 3/13/74, effective 4/15/74.]

WAC 296-126-050 Employment records. (1) Every employer shall keep for at least three years a record of the name, address, and occupation of each employee, dates of employment, rate or rates of pay, amount paid each pay period to each such employee and the hours worked.

(2) Every employer shall make the record described in subsection (1) available to the employee, upon request, at any reasonable time.

(3) Every employer shall, upon written request by the employee, furnish within ten working days of the request to each employee who is discharged a signed written statement, setting forth the reasons for such discharge and the effective date thereof.

[Statutory Authority: RCW 43.22.270, 49.12.020, 49.12.091, 49.12.050, 49.46.020 and 49.46.070. 89-22-016 (Order 89-16), § 296-126-050, filed 10/24/89, effective 11/24/89; Order 74-9, § 296-126-050, filed 3/13/74, effective 4/15/74.]

WAC 296-126-060 Minor work permits. No minor shall be employed in any occupation or industry unless the employer shall have on file during the period of employment an unexpired work permit issued pursuant to section 15, chapter 16, Laws of 1973 2nd ex. sess., and regulations implementing said section in chapter 296-125 WAC. Such permit will not be issued except upon presentation of such

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evidence of age as is required by the industrial welfare committee.

[Order 74-9, § 296-126-060, filed 3/13/74, effective 4/15/74.]

WAC 296-126-070 Prohibited action. No employer shall discharge or in any other way discriminate against or penalize any employee who seeks information or a hearing concerning variance requests by an employer or information concerning employment standards, or who has filed a complaint alleging a violation of any employment standard.

[Order 74-9, § 296-126-070, filed 3/13/74, effective 4/15/74.]

WAC 296-126-080 Posting of order. The employer shall keep posted a current copy of these regulations in a form provided by the department. The poster shall be positioned in a readily accessible location and within plain view in each work site where an employee or employees are employed.

[Order 74-9, § 296-126-080, filed 3/13/74, effective 4/15/74.]

WAC 296-126-090 Hours. Any employee who feels the number of hours or other matters relating to overtime employment are detrimental to the health, safety or welfare of the employee may request the department of labor and industries to make an investigation following which the department will issue findings and conclusions. Whenever the circumstances are found to be detrimental to the health, safety or welfare of the employee, the industrial welfare committee may adopt additional or revised employment standards.

[Order 76-15, § 296-126-090, filed 5/17/76.]

WAC 296-126-092 Meal periods—Rest periods. (1) Employees shall be allowed a meal period of at least 30 minutes which commences no less than two hours nor more than five hours from the beginning of the shift. Meal periods shall be on the employer's time when the employee is required by the employer to remain on duty on the premises or at a prescribed work site in the interest of the employer.

(2) No employee shall be required to work more than five consecutive hours without a meal period.

(3) Employees working three or more hours longer than a normal work day shall be allowed at least one 30-minute meal period prior to or during the overtime period.

(4) Employees shall be allowed a rest period of not less than 10 minutes, on the employer's time, for each 4 hours of working time. Rest periods shall be scheduled as near as possible to the midpoint of the work period. No employee shall be required to work more than three hours without a rest period.

(5) Where the nature of the work allows employees to take intermittent rest periods equivalent to 10 minutes for each 4 hours worked, scheduled rest periods are not required.

[Order 76-15, § 296-126-092, filed 5/17/76.]

WAC 296-126-094 General duty—Working conditions. It shall be the responsibility of every employer to maintain conditions within the work place environment that will not endanger the health, safety or welfare of employees. All facilities, equipment, practices, methods, operations and procedures shall be reasonably adequate to protect employees' health, safety and welfare.

[Order 76-15, § 296-126-094, filed 5/17/76.]

WAC 296-126-096 Lifting. Where weights in excess of 20 pounds are to be lifted, carried, pushed or pulled as a normal part of an employee's responsibility:

(1) The lifting, carrying, pushing or pulling duties shall be made known to the prospective employee at the time of recruitment, initial employment or reassignment to a lifting job.

(2) Instruction shall be given such employees on proper lifting techniques in accordance with instructions provided or approved by the department of labor and industries.

(3) Assurance that adequate instructions in weight lifting techniques have been given as provided in (2) shall be furnished the committee or its authorized agent upon request.

[Order 76-15, § 296-126-096, filed 5/17/76.]

WAC 296-126-130 Variance. (1) Upon written application from an employer, a variance from any standard herein may be granted by the industrial welfare committee for good cause shown as authorized by section 8, chapter 16, Laws of 1973 2nd ex. sess. The employer shall give notice to the employees or their representative so that they may submit their written views to the committee on any variance request.

(2) The committee may afford the applicant and any involved employee, or their representatives, the opportunity for oral presentation whenever circumstances of the particular application warrant such additional procedure.

(3) Temporary variance valid for not more than thirty calendar days may be issued by the committee for good cause where immediate action is necessary and warranted pending further review by the committee.

(4) "Good cause" shall mean, but not be limited to, those situations in which the employer finds that his circumstance warrants an alternative procedure and where he is able to demonstrate to the committee that such alternative would not have a harmful effect on the health, safety and welfare of the employees involved.

[Order 74-9, § 296-126-130, filed 3/13/74, effective 4/15/74.]

WAC 296-126-200 Applicability. WAC 296-126-200 through 296-126-226 shall apply to persons employed in counselor staff occupations in organized seasonal recreational camps as herein defined.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-200, filed 2/3/78.]

WAC 296-126-202 Definitions. (1) "Department" shall mean the department of labor and industries.

(2) "Committee" shall mean the industrial welfare committee of the department of labor and industries.

(3) "Organized camps," as used herein, shall refer to established resident group camps, which are established and maintained for recreation, education, vacation, or religious purposes, for use by organized groups wherein the activities are conducted on a closely supervised basis, and where day-to-day living facilities, including food and lodging, are provided either free-of-charge or by payment of fee.

(4) "Employ" means to engage, suffer, or permit to work.

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(5) "Employee" shall mean any person who is employed in a counselor staff occupation in an organized seasonal recreational camp as herein defined.

(6) "Employer" means any person, association, partnership, private or public corporation who employs or exercises control over wages, hours, or working conditions of one or more employees.

(7) "Minor" shall mean any person under eighteen years of age.

(8) "Counselor staff occupations" shall include all work involving duties primarily relating to guidance, instruction, supervision, and care of campers in organized camps, whether such work involves direct charge of, or responsibility for, such activities, or merely assistance to persons in charge; but shall not include preseason training courses. Counselor staff occupations include, but are not limited to: Head counselor, assistant head counselor, specialist counselor or instructor (such as swimming counselor, arts and crafts counselor, etc.), group or division leader, camp parent, teacher, supervising counselor, senior counselor, counselor, general counselor, bunk counselor, assistant counselor, junior counselor, counselor aide, and kitchen helpers working no more than 27 hours in a given work week.

(9) "Resident counselor staff" shall mean staff who receive lodging and meals from the employer.

(10) "Nonresident counselor staff" shall mean staff who do not receive lodging and meals from the employer.

(11) "Counselor I," "Counselor II," and "Counselor III," shall be defined for purposes of this standard as follows: "Counselor I" is one never before employed in any counselor staff occupations; "Counselor II" is one who has had at least one season's employment in a counselor staff occupation; "Counselor III" is one who has had at least three seasons of employment in a counselor staff occupation.

(12) "Season of employment" is defined as a period of not less than six weeks, nor more than 12 weeks in any one calendar year, except that counselors employed less than six weeks in any one season may accumulate their employment experience from year to year to meet the minimum requirements for counselor grade.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-202, filed 2/3/78.]

WAC 296-126-204 Minimum wage. Except as otherwise provided by chapter 49.46 RCW:

(1) The minimum wage for kitchen helpers working in excess of 27 hours per week, camp cooks, and all employees other than counselor staff, shall be no less than \$2.00 per hour for employees 18 years of age or older, and no less than \$1.75 for employees under age 18.

(2) Minimum wage rates for counselor staff occupations shall be as follows:

	MINIMUM WEEKLY RATE	
	Nonresident Employee (6-day week)	Resident Employee (6-day week)
COUNSELOR III	\$66.00	\$51.00
COUNSELOR II	45.00	30.00
COUNSELOR I	36.00	21.00

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(3) The minimum daily wage rate for resident or nonresident counselor staff shall be prorated from the six-day basis.

(4) Minimum wage provisions shall not apply to resident campers under the age of 18 who are engaged in an in-training program, which provides prepared instructions and supervision by qualified counselor staff, and which requires no more than 24 on-duty hours weekly. Such resident campers shall (a) carry no responsibility for other campers and no bunk responsibility, except as a defined part of the training program and (b) shall not enter such a program unless their parents or guardians sign an authorization, which includes an outline of the program and a description of the duties and responsibilities involved.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-204, filed 2/3/78.]

WAC 296-126-206 Limitation on number of employees paid in Counselor I and Counselor II rates. In any week, an employer may pay the Counselor I rate to no more than 30 percent of the total number of employees in counselor staff occupations. Furthermore, the total number of employees paid at the Counselor I and Counselor II rates may not exceed 80 percent of the total staff. In small camps (40 campers or under) where the above percentage limitations may be unworkable, the supervisor of employment standards shall have authority to make reasonable adjustments of these limitations upon a showing that the above limitations will work a hardship.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-206, filed 2/3/78.]

WAC 296-126-208 Premium pay for resident counselor staff occupations. At termination of employment, a resident counselor staff member shall be entitled to premium payment of an additional 25 percent of the staff member's weekly rate of pay for each week of employment, unless he or she received 24 hours per week off-duty, 12 hours of which must have been in sequence. The 24 hours off-duty time need not have been accumulated in any one week.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-208, filed 2/3/78.]

WAC 296-126-210 Board, lodging, and other services. The minimum wage rates of resident counselor staff shall be subject to no charge by an employer for lodging or meals furnished by the employer or for any other services furnished in connection with camp business within reason.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-210, filed 2/3/78.]

WAC 296-126-212 Travel expenses. The employer shall pay the fare or make transportation available for any counselor staff member who is required or permitted to supervise, or assist in supervising, campers in transit.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-212, filed 2/3/78.]

WAC 296-126-214 Records. Records showing the names of employees, dates of employment, wages paid, and days worked by them shall be kept by every employer for a period of at least three years and available for inspection by

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the representatives of the industrial welfare committee of the department of labor and industries at all reasonable times.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-214, filed 2/3/78.]

WAC 296-126-216 Agreements. All employees must enter into a written agreement with the camp administration setting forth the remuneration, room and board, special services provided, and the nature of the work assignment as counselors and leaders. Resident camper parental authorizations and employee agreements are to be kept on file for a three-year period.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-216, filed 2/3/78.]

WAC 296-126-218 Work permits. No minor shall be employed until the employer has applied for and received a permit to employ minors from the department of labor and industries, and has obtained a parental authorization and proof of age document for each minor employee.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-218, filed 2/3/78.]

WAC 296-126-220 Minors' occupations. No minor worker shall be employed in any occupation which the department of labor and industries, through the industrial welfare committee, shall declare to be particularly hazardous for minors under the age specified in the minor work permit regulation, chapter 296-125 WAC.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-220, filed 2/3/78.]

WAC 296-126-222 Sanitation and safety. (1) All places of employment shall be maintained in a sanitary condition in conformity with the requirements for sanitation for camps set by the health services division, department of social and health services and/or the Washington Industrial Safety and Health Act (WISHA).

(2) All places of employment shall be maintained in a safe condition in conformity with the WISHA standards of the department of labor and industries, division of industrial safety and health.

(3) First aid requirements of the WISHA standards of the department of labor and industries shall be met. In addition, the provision of an infirmary with the full-time services of a physician and/or registered nurse is recommended for camps operated by one organized group for more than two weeks.

(4) Transportation shall be available at all times for use in case of an emergency and shall be of a nature to render reasonable comfort to an injured person.

(5) If preemployment physical examinations, including preventive inoculations, recommended by public health authorities are required of employees, such examinations shall not be at the expense of the employee.

(6) No employee shall be required or permitted to lift or carry excessive weights. Where weights in excess of 20 pounds are to be lifted, carried, pushed, or pulled as a normal part of an employee's responsibility:

(i) The lifting, carrying, pushing or pulling duties shall be made known to the prospective employee at the time of

recruitment, initial employment or reassignment to a lifting job.

(ii) Instruction shall be given such employees on proper lifting techniques in accordance with instructions provided or approved by the department of labor and industries.

(iii) Assurance that adequate instruction in weight lifting techniques have been given as provided in (ii) shall be furnished the committee or its authorized agent upon request.

(7) Employee assignments to counseling duties shall be in keeping with the employee's maturity, knowledge, and skills. The health and welfare of the employee shall be considered in the determination of adequate counselor staff-camper ratios. Personnel should be selected on the basis of standards currently prescribed in the American Camping Association Resident Camp standards.

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-222, filed 2/3/78.]

WAC 296-126-226 Penalties. The department shall investigate the complaint of any individual alleging that these standards have been violated. Any employer employing any person in violation of these standards shall upon conviction thereof be punished in accordance with RCW 49.12.170, which states as follows: "Any employer employing any person for whom a minimum wage or standards, conditions, and hours of labor have been specified, at less than said minimum wage, or under standards, or conditions of labor or at hours of labor prohibited by the rules and regulations of the committee; or violating any other of the provisions of this 1973 amendatory act, shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof, be punished by a fine of not less than twenty-five dollars nor more than one thousand dollars."

[Statutory Authority: RCW 49.12.091. 78-03-004 (Order 78-1), § 296-126-226, filed 2/3/78.]

**Chapter 296-127 WAC
PREVAILING WAGE**

WAC

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**DISPOSITION OF SECTIONS FORMERLY
CODIFIED IN THIS CHAPTER**

296-127-016 Coverage and exemptions of workers involved in the production and delivery of materials predominantly used in road construction. [Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 88-22-046 (Order 88-22), § 296-127-016, filed 10/31/88.] Repealed by 92-01-104, filed 12/18/91, effective 1/31/92. Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270.

WAC 296-127-010 Definitions for chapter 296-127

WAC. (1) "Department" means the department of labor and industries.

(2) "Director" means the director of the department or his or her duly authorized deputy or representative.

(3) "Industrial statistician" means the industrial statistician of the department's employment standards, apprenticeship, and crime victims (ESAC) division.

(4) "Assistant director" means the assistant director of the employment standards, apprenticeship, and crime victims (ESAC) division or his or her duly authorized deputy or representative.

(5) "Contractor" means:

(a) The prime contractor, and each and every subcontractor, required to be registered under chapter 18.27 RCW and/or licensed under chapter 19.28 RCW, that performs any work on a public works project site, and/or is required to pay industrial insurance premiums as a construction company.

(b) Employers engaged in shipbuilding and ship repair, building service maintenance, and any fabricator or manufacturer that produces nonstandard items specifically for a public works project.

(c) Employers that contract with contractors or subcontractors for the purpose of the production and/or delivery of materials pursuant to the terms of WAC 296-127-018.

(6) The term municipality shall include every city, county, town, district, political subdivision, or other public agency thereof which is authorized by law to require the execution of public work, except drainage districts, diking districts, diking and drainage improvement districts, drainage improvement districts, diking improvement districts, consolidated diking and drainage improvement districts, consoli-

dated drainage improvement districts, consolidated diking improvement districts, irrigation districts, or any such other districts as shall from time to time be authorized by law for the reclamation or development of waste or undeveloped lands.

(7)(a) The term "public work" shall include:

(i) All work, construction, alteration, enlargement, improvement, repair, and/or demolition that is executed by contract, purchase order, or any other legal agreement and that is executed at the cost of the state of Washington or of any municipality. The source of the funding shall not determine the applicability of the statute, and may include, but is not limited to, such sources as those payments made through contracts with insurance companies on behalf of the insured state or municipality;

(ii) All work, construction, alteration, enlargement, improvement, repair, and/or demolition which, by law, constitutes a lien or charge on any property of the state or of a municipality;

(iii) All work, construction, alteration, repair, or improvement, other than ordinary maintenance that the state or a municipality causes to be performed by a private party through a contract to rent, lease, or purchase at least fifty percent of the project by one or more state agencies or municipalities, pursuant to RCW 39.04.260;

(iv) Maintenance, except ordinary maintenance as defined by (b)(iii) of this subsection, when performed by contract. Maintenance is defined as keeping existing facilities in good usable, operational condition;

(v) Janitorial and building service maintenance as defined by WAC 296-127-023, when performed by contract, on public buildings and/or assets; and

(vi) The fabrication and/or manufacture of nonstandard items produced by contract specifically for a public works project as defined by (a)(i) through (v) of this subsection.

(b) The term "public work" shall not include:

(i) Work, construction, alteration, enlargement, improvement, repair, demolition, and/or maintenance for which no wage or salary compensation is paid, consistent with the requirements of RCW 35.21.278;

(ii) The construction, alteration, repair, or improvement of any municipal street railway system;

(iii) Ordinary maintenance which is defined as work not performed by contract and that is performed on a regularly scheduled basis (e.g., daily, weekly, monthly, seasonally, semiannually, but not less frequently than once per year), to service, check, or replace items that are not broken; or work not performed by contract that is not regularly scheduled but is required to maintain the asset so that repair does not become necessary.

(8) "Contract" means a contract, purchase order, or any other legal agreement in writing for public work to be performed for a fixed or determinable amount, which is duly awarded after advertisement and competitive bid. A contract that is awarded from a small works roster, or under the emergency provisions of state law, need not be advertised.

(9) "Residential construction" means construction, alteration, repair, improvement, or maintenance of single family dwellings, duplexes, apartments, condominiums, and other residential structures not to exceed four stories in height,

including basement, when used solely as permanent residences. It does not include the utilities construction (water and sewer lines), or work on streets, or work on other structures (e.g., for recreation and business.)

[Statutory Authority: RCW 39.12.070, 94-01-100, § 296-127-010, filed 12/16/93, effective 1/16/94. Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270, 92-01-104, § 296-127-010, filed 12/18/91, effective 1/31/92; 88-22-046 (Order 88-22), § 296-127-010, filed 10/31/88. Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020, 86-03-063 (Order 85-28), § 296-127-010, filed 1/17/86. Statutory Authority: RCW 39.12.015, 39.12.060 and HB 795, 1982 1st ex.s. c 38, 82-18-041 (Order 82-28), § 296-127-010, filed 8/27/82.]

WAC 296-127-011 Time for determining prevailing wage.

(1) Prevailing wage rates for all public work contracts will be determined by the industrial statistician and published on the first business day of February and the first business day of August of each year. These rates shall become effective thirty days after the date of publication. However, the industrial statistician may revise an established prevailing wage rate in response to an administrative or judicial finding overturning the established rate, or at any time necessary to correct an error, with such revision becoming effective thirty days after the date of publication. However, in the event of an emergency as determined by the director of the department, such revised rate shall take effect upon publication.

(2) The department shall establish deadlines for the submission of:

(a) Completed wage surveys, for inclusion of submitted data in the survey computations;

(b) Newly ratified collective bargaining agreements for inclusion in the semiannual prevailing wage publication;

(c) Notice of collectively bargained wage and benefit adjustments, and/or relevant contractual changes, for inclusion in the semiannual prevailing wage publication; and

(d) Notice of changes in apprenticeship standards and incremental wage rates for inclusion in the semiannual prevailing wage publication.

(3) The applicable prevailing wage rates for a given public works contract will be determined as follows:

(a) For all public works contracts, except janitorial or building service maintenance contracts, the applicable prevailing wage rates shall be the rates that are in effect on the date when bids by prime contractors are due for submission to contract awarding agencies. These rates shall remain in effect for the duration of the contract.

(b) If contracts are not awarded within six months of the date bids are due, the applicable prevailing wage rates shall be those that are in effect on the date the contract is awarded. These rates shall remain in effect for the duration of the contract.

(c) If a contract for public work is not awarded pursuant to bids, the applicable prevailing wage rates shall be those that are in effect on the date when the contract is executed. These rates shall remain in effect for the duration of the contract.

(4) A schedule of the applicable prevailing wage rates must be included by:

(a) Contract awarding agencies, in the bid specifications and contract documents for each contract.

(b) Contractors, in the bid and/or contract documents provided to subcontractors.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 92-01-104, § 296-127-011, filed 12/18/91, effective 1/31/92; 88-22-046 (Order 88-22), § 296-127-011, filed 10/31/88. Statutory Authority: RCW 39.12.015, 39.12.060 and HB 795, 1982 1st ex.s. c 38. 82-18-041 (Order 82-28), § 296-127-011, filed 8/27/82.]

WAC 296-127-013 Scope of work definitions. (1) In order to determine applicable prevailing wage rates, the industrial statistician will issue scope of work descriptions for each trade and occupation recognized as being involved in public work.

(2) The industrial statistician may issue scope of work descriptions, using authoritative sources available to the department, such as:

- (a) Washington state apprenticeship and training council approved apprenticeship standards;
- (b) Collective bargaining agreements;
- (c) Dictionaries of occupational titles;
- (d) Experts from organized labor, licensed contractors, and contractors' associations;
- (e) Recognized labor and management industry practice.

(3) The applicable prevailing wage rates for workers employed on public works projects shall be determined by the scopes of work performed by those workers, and not by their specific job titles.

(4) Scope of work descriptions may be established or revised:

(a) On the first business day of February and the first business day of August each year along with the prevailing wage publication; or

(b) In response to an administrative or judicial finding, or at any time necessary to correct an error.

(5) All scope of work descriptions shall become effective thirty days after their establishment or revision.

(6) The applicable scope of work description for a public works contract is the scope of work description that is in effect on the date that the bids are due to be submitted to the contract awarding agency. If the contract is not awarded within six months of the bid due date, then the applicable scope of work description shall be that which is in effect on the date that the contract is awarded. The same scope of work description shall remain in effect for the duration of the contract.

(7) The department shall make scope of work descriptions available to all interested parties upon request.

(8) The department shall notify trade associations, labor organizations, and public agencies, reasonably known to be affected, prior to adopting new scope of work descriptions or changes or additions to existing scope of work descriptions, and shall provide sixty days from the date of issuance for comment. In the event a dispute arises regarding a scope of work description following the award of a public works contract, the aggrieved party may request an arbitration hearing pursuant to the provisions of RCW 39.12.060, WAC 296-127-060, 296-127-061, and 296-127-062.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 92-01-104, § 296-127-013, filed 12/18/91, effective 1/31/92; 88-22-046 (Order 88-22), § 296-127-013, filed 10/31/88.]

WAC 296-127-014 Usual benefits. (1) Employers are not required to establish "usual benefit" programs. If an employer chooses not to provide such benefits, however,

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wages paid must be at the full prevailing wage rate as defined by RCW 39.12.010.

(2) To be deemed a "usual benefit," the following requirements must be satisfied:

(a) Employer payments for the usual benefit shall be made only in conformance with all applicable federal and state laws, including the requirements of the Employment Retirement Income Security Act of 1974, as amended, and of the Internal Revenue Service; and

(b) Employee payments toward the usual benefit, through self-contribution, payroll deduction, or otherwise, shall not constitute a credit to the employer for prevailing wage purposes.

(3) "Usual benefits" are limited to the following:

(a) Health and welfare payments. This is medical insurance, which may include dental, vision, and life insurance. Insurance programs providing protection against industrial accidents or occupational illnesses which are mandated by state or federal statutes, and all related mandatory forms of protection, shall not qualify as health and welfare insurance.

(b) Employer payments on behalf of a person employed for the purpose of providing retirement income.

(c) Vacation payments made either directly to the employees or into a vacation fund, provided these benefits are paid to the employees.

(d) Apprentice training fund. Payments made to training programs approved or recognized by the Washington state apprenticeship and training council.

(e) Paid holidays. Payments made to employees for specified holidays.

(4) Any fringe benefits required by other local, state, or federal laws do not qualify as "usual benefits."

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 92-01-104, § 296-127-014, filed 12/18/91, effective 1/31/92; 88-22-046 (Order 88-22), § 296-127-014, filed 10/31/88.]

WAC 296-127-01410 Information concerning prevailing wage usual benefits. (1) Contractors and employers shall conform to all posting and employee notification requirements provided by applicable federal and state laws concerning usual benefits plans.

(2) Contractors and employers must have, and make available to the department upon request, copies of all documents concerning usual benefits, as identified in WAC 296-127-014, for which employer payments are made.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 92-01-104, § 296-127-01410, filed 12/18/91, effective 1/31/92.]

WAC 296-127-015 Applicability of prevailing wages for supervisors. Determinations as to whether individuals are workers, laborers, or mechanics are based on the scope of work actually performed by the individuals, rather than the title of their occupations.

(1) Where additional supervisory duties are required of workers, laborers, or mechanics by statute or regulation, the industrial statistician shall establish a rate of pay for a work classification to be called "journey level in charge." These rates shall be published in the semiannual prevailing wage publication.

(2) Supervisors (e.g., foremen, general foremen, superintendents, etc.) are entitled to receive at least the journey level

prevailing rate of wage for performing manual or physical labor:

(a) For each hour spent in the performance of manual or physical labor if it is for more than twenty percent but less than fifty percent of their hours worked on a public works project during any given week.

(b) For all hours worked in any given week if they perform manual or physical labor for fifty percent or more of their hours worked on a public works project during such week.

(3) If supervisors subject to the journey level prevailing wage rate are paid a salary, the compensation (salary divided by number of hours worked) must be equal to or greater than the prevailing wage rate for the type of work performed.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 92-01-104, § 296-127-015, filed 12/18/91, effective 1/31/92; 88-22-046 (Order 88-22), § 296-127-015, filed 10/31/88.]

WAC 296-127-017 Notice of wage determinations.

Current prevailing wage data will be furnished by the office of the industrial statistician upon request.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 92-01-104, § 296-127-017, filed 12/18/91, effective 1/31/92. Statutory Authority: RCW 39.12.015, 39.12.060 and HB 795, 1982 1st ex.s. c 38. 82-18-041 (Order 82-28), § 296-127-017, filed 8/27/82.]

WAC 296-127-018 Coverage and exemptions of workers involved in the production and delivery of gravel, concrete, asphalt, or similar materials. The materials covered under this section are sand, gravel, crushed rock, concrete mix, asphalt, or other similar materials.

(1) Workers are subject to the provisions of chapter 39.12 RCW when they are employed by a contractor as defined by WAC 296-127-010 (5)(c) and:

(a) They are engaged for a public works project in the production of the above-listed materials in a sand or gravel pit, rock quarry, concrete mixing plant, or other similar facility; or

(b) They are engaged in the transportation of the above-listed materials for use on a public works project, whether or not they perform any work on the project site.

(2) All workers, regardless of by whom employed, are subject to the provisions of chapter 39.12 RCW when:

(a) They deliver any of the above-listed materials to a public works project site and perform any spreading, leveling, rolling, or otherwise participate in any incorporation of the materials into the project; or

(b) They wait at or near a public works project site to participate in the incorporation of any of the above-listed materials into the project; or

(c) They remove any materials from a public works construction site pursuant to contract requirements or specifications (e.g., excavated materials, materials from demolished structures, cleanup materials, etc.); or

(d) They work in a materials production facility (e.g., batch plant, borrow pit, rock quarry, etc.) which is established for a public works project for the specific, but not necessarily exclusive, purpose of supplying materials for the project.

(3) Workers are not subject to the provisions of chapter 39.12 RCW when:

(a) The employees' duties do not include spreading, leveling, rolling, or otherwise participating in the incorporation of the delivered materials into a public works project, and they are employed by an established materials supplier either in the production or delivery of sand, gravel, crushed rock, concrete mix, asphalt or other similar materials;

(b) They are employed by a common or contract carrier trucking company principally or exclusively engaged in the hauling or delivery of such products, and the employees' duties do not include spreading, leveling, rolling, or otherwise participating in the incorporation of the delivered materials into a public works project; or

(c) Their employer is engaged in the production and stockpiling of such materials for unspecified future use by the state of Washington or by municipalities as defined by RCW 39.04.010.

(4) The applicable prevailing wage rate shall be determined by the locality in which the work is performed. Workers subject to the provisions of chapter 39.12 RCW, as outlined in subsection (1) of this section, who produce such materials at an off-site facility shall be paid the applicable prevailing wage rates for the county in which the off-site facility is located. Workers subject to the provisions of chapter 39.12 RCW, as outlined in subsection (1) of this section, who deliver such materials to a public works project site shall be paid the applicable prevailing wage rates for the county in which the public works project is located.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 92-01-104 and 92-08-101, § 296-127-018, filed 12/18/91 and 4/1/92, effective 8/31/92.]

WAC 296-127-019 Survey methodology. (1) The industrial statistician shall establish prevailing wage rates by:

(a) Conducting wage and hour surveys for established trades and occupations;

(b) Adopting the wage and benefit adjustments established in collective bargaining agreements for those trades or occupations where the most recently established prevailing wage rates were derived from a collective bargaining agreement; and/or

(c) In instances when the procedures established in (a) and (b) of this subsection are not feasible, employing other methods deemed appropriate by the industrial statistician as set out in subsection (8) of this section.

(2) The department will determine the identity of employers to be surveyed for a specific trade or occupation by:

(a) Mailing trade and occupation questionnaires to all contractors whose registration under chapter 18.27 RCW or license under chapter 19.28 RCW is active;

(b) Mailing trade and occupation questionnaires to Washington state department of transportation prequalified contractors; and

(c) Compiling and maintaining lists of employers that are not required to be registered under chapter 18.27 RCW or licensed under chapter 19.28 RCW, but that employ workers in building service maintenance, in shipbuilding or ship repair, in the fabrication and/or manufacture of nonstandard items produced specifically for a public works project, and/or in the production and delivery of materials as defined in WAC 296-127-018. Trades and occupations utilized by the

shipbuilding and ship repair industries shall not have their survey data combined with their construction counterparts, for the purpose of establishing prevailing wage rates for that industry.

(3)(a) Wage survey forms will be mailed to:

(i) Those contractors and employers whose businesses currently are active and were active during the established survey period, and whose response to the trade and occupation questionnaire indicates that they employ one or more of the trades or occupations being surveyed; and

(ii) Labor unions representing workers in the trades or occupations being surveyed.

(b) The department annually shall mail to state-wide trade associations and state-wide labor organizations a proposed schedule of trades intended to be surveyed during the upcoming fiscal year. In addition, the department shall notify those state-wide trade associations and labor organizations, reasonably known to be affected, of the mailing of wage surveys.

(4) Data reported on survey forms may be verified by the department, and will be used only when submitted on behalf of or by:

(a) Individual contractors identified by a contractor registration number that currently is valid, and was valid during the established survey period;

(b) Employers that are not required to be registered under chapter 18.27 RCW or licensed under chapter 19.28 RCW, that directly employ and supervise workers as employees in building service maintenance, in shipbuilding or ship repair, in the manufacture of nonstandard items specifically produced for a public works project, or in the production and delivery of materials, as defined in WAC 296-127-018;

(c) Labor unions submitting wage and hour data on behalf of contractors and/or employers who are signatory to those unions' collective bargaining agreements covering the trade or occupation being surveyed; or

(d) Interested parties providing wage and hour data by trade and occupation from certified payroll records and/or from hours reported by trade and occupation on affidavits of wages paid, according to guidelines established by the department.

(5) The department shall use affidavit forms that include a requirement that contractors report the actual number of hours worked by each trade and occupation utilized on the public works project for which the affidavit is filed.

(6) Valid data reported on wage surveys shall be calculated, as follows:

(a) If the majority of hours reported for a trade or occupation in the largest city in a county is paid at the same wage rate, then that rate shall be established as the prevailing wage rate.

(b) If the same wage rate is not reported to have been paid for the majority of hours reported in the largest city in a county for a trade or occupation, then the average wage rate shall be established as the prevailing wage rate, based on a weighted average of the hours, wages, and benefits reported in the largest city.

(c) If a statistically significant number of hours fails to be reported for the largest city in a county, then the average

wage rate for the county is established as the prevailing wage, based on a weighted average.

(d) If there fails to be reported for an entire county, sufficient hours to validate the survey data, that county's hours shall be combined with those reported for other counties that are adjacent, until the established hours threshold for validation has been met.

(7) Survey data will not be accepted if the data report the hours and wages of those who are exempt from the prevailing wage requirements of chapter 39.12 RCW, as defined in WAC 296-127-026.

(8)(a) The industrial statistician may utilize alternative methods to establish prevailing wage rates consistent with the terms of (b) of this subsection. These methods include, but are not limited to:

(i) The use of wage and hour data from the department of employment security;

(ii) The use of wage and hour data from the industrial insurance division of the department of labor and industries;

(iii) The use of data from surveys performed by the United States Department of Labor, wage and hour division; or

(iv) The use of wage and hour data reported to the department on affidavits of wages paid.

(b) These alternative methods will not be used for trades or occupations for which surveys had been completed as of the effective date of this section unless a subsequent survey produces insufficient data. In addition, these alternative methods may be used under circumstances that include, but are not limited to, the following:

(i) To establish prevailing wage rates for a new trade or occupation where a survey is not immediately feasible;

(ii) In response to an administrative or judicial determination of invalid wage rate or scope of work description;

(iii) In response to changes or additions in licensing, safety, or other requirements of other state agencies, departments or divisions; or

(iv) To establish rates for industries and trades and occupations generally not surveyed, in order to meet the requirement of having established wage rates for publication in contract or bid specifications as required by RCW 39.12.030.

(9) Any party that submits false information under this section shall, after a determination to that effect has been issued by the director after a hearing pursuant to chapter 34.05 RCW, forfeit as a civil penalty the sum of five hundred dollars.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270, 92-01-104, § 296-127-019, filed 12/18/91, effective 1/31/92; 88-22-046 (Order 88-22), § 296-127-019, filed 10/31/88.]

WAC 296-127-020 Interpretation of phrases used in chapter 39.12 RCW. (1) The "acceptance date of the public works project" referred to in RCW 39.12.065 is the date that the contract awarding agency formally accepts the completed public works project pursuant to state law.

(2) RCW 39.12.050 and 39.12.065 refer to "inadvertent filing or reporting error." The department defines an error as "inadvertent" if it is made by a contractor, as defined by WAC 296-127-010(5), or employer that shows that the error was made notwithstanding the use of due care by the contractor or employer. The burden of proving that an error is inad-

vertent rests with the contractor or employer charged with the error.

(3) The definition of "locality" in RCW 39.12.010(2) contains the phrase "wherein the physical work is being performed." The department interprets this phrase to mean the actual work site. For example, if nonstandard items specifically produced for public works projects are prefabricated in a county other than the county wherein the public works project is to be completed, the wage for the off-site prefabrication shall be the applicable prevailing wage for the county in which the actual prefabrication takes place. Workers who deliver such nonstandard items, as well as materials pursuant to the terms of WAC 296-127-018, shall be paid the applicable prevailing wage for the county in which the public works project is located.

(4) In the implementation and enforcement of RCW 39.12.050 the terms "contractor" and "subcontractor" include an entity, however organized, with substantially identical corporate and/or operational structure to an entity that has been found to violate RCW 39.12.050. The factors used to determine substantial identity shall include an assessment of whether there is: Substantial continuity of the same business operation; use of the same machinery and/or equipment; similarity of jobs and types of working conditions; continuity of supervisors; and similarity of product or services.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 92-01-104, § 296-127-020, filed 12/18/91, effective 1/31/92. Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-020, filed 1/17/86. Statutory Authority: RCW 39.12.015, 39.12.060 and HB 795, 1982 1st ex.s. c 38. 82-18-041 (Order 82-28), § 296-127-020, filed 8/27/82.]

WAC 296-127-021 Apprentice worker. Any apprentice employed on public works projects for whom an apprenticeship agreement is registered and approved by the state apprenticeship council pursuant to chapter 49.04 RCW within 60 days of hiring may be considered an apprentice and paid the applicable prevailing hourly rate for an apprentice of that trade for all hours worked.

[Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38. 82-18-041 (Order 82-28), § 296-127-021, filed 8/27/82.]

WAC 296-127-022 Overtime according to RCW 49.28.065. (1) Work performed on public works contracts will not require the payment of overtime rates for the first two hours worked in excess of eight hours per day when the employer and employee voluntarily enter into an agreement wherein the employee will work up to ten hours per day in a four-day week to accomplish forty hours of work.

(2) Recognizing that there may be days when a full ten hours of work is not available, the remainder of the forty hours may be made up on another work day or days within the same work week, except work performed on Saturdays, Sundays, and holidays is subject to the established prevailing overtime provisions for a given trade or occupation, as provided in chapter 39.12 RCW.

(3) For the purpose of this section an agreement must:

(a) Have been authorized by employees who bargained collectively with their employers through representatives of their own choosing; or

(b) Be obtained in writing, signed, and dated by both parties; and

(c) Be entered into individually with each employee; and

(d) Be entered into separately for each public works project, except that an employer, at its option, may obtain an annual authorization; and

(e) State the name of the public works project with specificity; and

(f) Be entered into voluntarily by the employer and employee.

(4) Each employer must retain copies of the individual employee authorization agreements required pursuant to subsection (3) of this section for three years from the date of acceptance of the public works project by the contract awarding agency. Absence of an authorization record for an employee shall be deemed per se evidence of lack of that employee's authorization. Such records are payroll records, subject to the requirements of WAC 296-127-320.

(5) It is prohibited to work more than ten hours in any calendar day on a public works project except in cases of extraordinary emergency, such as danger to life or property.

(6) Notwithstanding the above provisions, overtime rates must be paid for all hours worked in excess of forty hours per week.

(7) This section provides a minimum public works overtime standard, and does not supersede prevailing overtime wage rates established under the authority of chapter 39.12 RCW.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 92-01-104, § 296-127-022, filed 12/18/91, effective 1/31/92. Statutory Authority: RCW 43.22.270. 88-19-055 (Order 88-21), § 296-127-022, filed 9/15/88.]

WAC 296-127-023 Building service maintenance. The "public building service maintenance contracts" referred to in RCW 39.12.020 shall mean janitorial service contracts and cover only work performed by janitors, waxers, shampooers, and window cleaners.

For all building service maintenance contracts, the prevailing wage rates which are in effect on the date when the bids are required to be submitted to the contract awarding public agency are the minimum prevailing wage rates which must be paid for the first year of such contracts and thereafter. However, any building service maintenance contract of more than one year duration, must include wage increase language recognizing the potential for future variance in applicable prevailing wage(s) and specifying that the wages which a contractor shall pay its employees must be altered annually to recognize and follow the most recently promulgated increases in prevailing wages each year after the first year of the contract period. The cost of the increases in the wages due employees shall be borne by the contract awarding agency.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 88-22-046 (Order 88-22), § 296-127-023, filed 10/31/88.]

WAC 296-127-025 Applicability of joint federal-state standards. (1) When a public works project is subject to the provisions of the Washington state public works law, chapter 39.12 RCW, and the Federal Davis-Bacon and related acts, the contractor and every subcontractor on that project must pay at least the Washington state prevailing wage rates, if

they are higher than the federal prevailing wage rates for the project unless specifically preempted by federal law.

(2) When the federal prevailing wage rates are higher than the Washington state prevailing wage rates, the contractor shall pay the federal rate as required by federal law.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 92-01-104, § 296-127-025, filed 12/18/91, effective 1/31/92; 88-22-046 (Order 88-22), § 296-127-025, filed 10/31/88.]

WAC 296-127-026 Exemptions for sole owners and their spouses, partnerships, corporations, and employees of public agencies. The prevailing wage requirements of chapter 39.12 RCW do not apply to:

(1) Sole owners and their spouses.

(2) Any partner who owns at least thirty percent of a partnership.

(3) The president, vice-president and treasurer of a corporation if each one owns at least thirty percent of the corporation.

(4) Workers regularly employed on monthly or per diem salary by the state or any political subdivision created by its laws.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 88-22-046 (Order 88-22), § 296-127-026, filed 10/31/88.]

WAC 296-127-030 Irrigation district exemption. Contracts awarded by irrigation districts for the reclamation or development of waste or undeveloped lands are not covered by the prevailing wage law, pursuant to RCW 39.04.010. Any work, construction alteration, repair or improvement that is not solely for the reclamation or development of waste or undeveloped land is covered by the prevailing wage laws and therefore subject to all the laws and regulations contained in and adopted pursuant to chapter 39.12 RCW.

[Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38. 82-18-041 (Order 82-28), § 296-127-030, filed 8/27/82.]

WAC 296-127-040 Statement of intent to pay prevailing wages. (1) All statements of intent to pay prevailing wages submitted to the industrial statistician of the department shall be accompanied by a fee of twenty-five dollars for each statement. Fees shall be made payable to the department of labor and industries.

(2) Any agency, division, or department of the state of Washington which through agreement with the department certifies statements of intent for its own contracts shall provide to the industrial statistician each month the number of statements of intent certified and quarterly shall send a fee of twenty dollars for each statement of intent to pay prevailing wages it has certified. This fee shall be sent to the industrial statistician and be made payable to the department of labor and industries.

[Statutory Authority: RCW 39.12.070. 94-01-100, § 296-127-040, filed 12/16/93, effective 1/16/94. Statutory Authority: RCW 43.22.270. 90-24-053, § 296-127-040, filed 12/3/90, effective 1/3/91. Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 88-22-046 (Order 88-22), § 296-127-040, filed 10/31/88. Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38. 82-18-041 (Order 82-28), § 296-127-040, filed 8/27/82.]

(1999 Ed.)

WAC 296-127-045 Affidavit of wages paid. (1) All affidavits of wages paid submitted to the industrial statistician of the department shall be accompanied by a fee of twenty-five dollars for each affidavit of wages paid. All fees shall be made payable to the department of labor and industries.

(2) Any agency, division, or department of the state of Washington which through agreement with the department certifies affidavits of wages paid for its own contracts shall provide to the industrial statistician each month the number of affidavit of wages paid it has certified and quarterly shall send a fee of twenty dollars for each affidavit of wages paid it has certified. This fee shall be sent to the industrial statistician and be made payable to the department of labor and industries.

[Statutory Authority: RCW 39.12.070. 94-01-100, § 296-127-045, filed 12/16/93, effective 1/16/94. Statutory Authority: RCW 43.22.270. 90-24-053, § 296-127-045, filed 12/3/90, effective 1/3/91. Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 88-22-046 (Order 88-22), § 296-127-045, filed 10/31/88. Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38. 82-18-041 (Order 82-28), § 296-127-045, filed 8/27/82.]

WAC 296-127-050 Filing of statements of intent to pay prevailing wages and affidavits of wages paid for contracts under two thousand five hundred dollars. A contract awarding agency may, as part of a public works contract, enter into an agreement with a contractor to approve statements of intent to pay prevailing wages and affidavits of wages paid on behalf of the department for contracts wherein the total amount does not exceed two thousand five hundred dollars as provided in RCW 39.12.040(2), pursuant to the following terms:

(1) The agreement must be incorporated into the bid specifications and contract document;

(2) Statement of intent forms and affidavit of wages paid forms, provided by the department, must be filed with the contract awarding agency by the contractor prior to the disbursement of public funds;

(3) Contract awarding agencies must retain copies of all statements of intent to pay prevailing wages received pursuant to this section for a period of not less than three years;

(4) Contract awarding agencies must send to the department copies of all affidavits of wages paid received pursuant to this section within thirty days of receipt from the contractor;

(5) The contract awarding agency shall accept full responsibility and liability for payment of any valid wage claims directly to the claimant;

(6) The contract awarding agency may proceed against any contractor found to have violated the provisions of the statute, and may debar such contractor from consideration for future contracts for up to one year and will provide the department with the names and contractor registration or other employer identification numbers of any such debarred contractors within thirty days of the debarment; and

(7) Contract awarding agencies and contractors shall not enter into contracts or agreements to perform public work that subdivide or otherwise disaggregate any public works project of more than two thousand five hundred dollars, to

enable such public works project to be awarded pursuant to this section.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270, 92-01-104, § 296-127-050, filed 12/18/91, effective 1/31/92.]

WAC 296-127-060 Director of department of labor and industries to arbitrate disputes—General provisions.

(1) The contract executed between a public authority and the successful bidder or contractor and all of his subcontractors shall contain a provision that in case any dispute arises as to what are the prevailing rates of wages for a specific trade, craft or occupation and such dispute cannot be adjusted by the parties in interest, including labor and management representatives, the matter shall be referred for arbitration to the director, and his decision shall be final, conclusive, and binding on all parties involved in the dispute.

(2) In exercising his authority to hear and decide disputes the director shall consider among other things, timeliness, the nature of the relief sought, matters of undue hardship or injustice, or public interest. A "timely" request for arbitration is one received within 30 days after the contract has been awarded.

(3) Any party in interest who is seeking a modification or other change in a wage determination under RCW 39.12.015, and who has requested the industrial statistician to make such modification or other change and the request has been denied, after appropriate reconsideration by the assistant director shall have a right to petition for arbitration of the determination.

(a) For purpose of this section, the term "party in interest" is considered to include, without limitation:

(i) Any contractor, or an association representing a contractor, who is likely to seek or to work under a contract containing a particular wage determination, or any worker, laborer or mechanic, or any council of unions or any labor organization which represents a laborer or mechanic who is likely to be employed or to seek employment under a contract containing a particular wage determination, and

(ii) Any public agency concerned with the administration of a proposed contract or a contract containing a particular wage determination issued pursuant to chapter 39.12 RCW.

(b) For good cause shown, the director may permit any party in interest to intervene or otherwise participate in any proceeding held by the director. A petition to intervene or otherwise participate shall be in writing, and shall state with precision and particularity:

(i) The petitioner's relationship to the matters involved in the proceedings, and

(ii) The nature of the presentation which he would make. Copies of the petition shall be served on all parties or interested persons known to be participating in the proceeding, who may respond to the petition. Appropriate service shall be made of any response.

[Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38. 82-18-041 (Order 82-28), § 296-127-060, filed 8/27/82.]

WAC 296-127-061 Requests for arbitration. (1) The petition for arbitration (original and four copies) shall be filed with Director, Department of Labor and Industries, General

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Administration Building, Olympia, Washington 98504. In addition, copies of the petition shall be served personally or by mail upon each of the following:

(a) The public agency or agencies involved,

(b) The industrial statistician, and

(c) Any other person (or the authorized representatives of such person) known to be interested in the subject matter of the petition.

(2) The director shall under no circumstances request any administering agency to postpone any contract performance because of the filing of a petition. This is a matter which must be resolved directly with the administering agency by the petitioner or other party in interest.

(3) A petition for arbitration of a wage determination shall:

(a) Be in writing and signed by the petitioner or his counsel (or other authorized representative), and

(b) Identify clearly the wage determination, location of project or projects in question, and the agency concerned, and

(c) State that the petitioner has requested reconsideration of the wage determination in question and describe briefly the action taken in response to the request, and

(d) Contain a short and plain statement of the grounds for review, and

(e) Be accompanied by supporting data, views, or arguments, and

(f) Be accompanied by a filing fee of \$75.00. Fees shall be made payable to the department of labor and industries.

[Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38. 82-18-041 (Order 82-28), § 296-127-061, filed 8/27/82.]

WAC 296-127-062 Conduct of arbitration hearing.

(1) Interested persons other than the petitioner shall have a reasonable opportunity as specified by the director in particular cases to submit to the director written data, views, or arguments relating to the petition. Such material (original and four copies) shall be filed with the Director, Department of Labor and Industries, General Administration Building, Olympia, Washington 98504 and be accompanied by a filing fee of \$35.00. Fees shall be made payable to the department of labor and industries. Copies of any such material shall be served on the petitioner and other interested persons.

(2) Each party in interest shall have the right to appear in person or by or with counsel or other qualified representatives in any proceeding before the director. If all parties agree, oral testimony may be waived and arguments submitted in writing.

(3) Upon his own initiative or upon motion of any interested person or party, the director may consolidate in any proceeding or concurrently consider two or more appeals which involve substantially the same persons or parties, or issues which are the same or closely related, if he finds that such consolidation or concurrent review will contribute to an efficient review and to the ends of justice, and it will not unduly delay consideration of any such appeals.

(4) The director shall prescribe the time and place for hearing. The director shall schedule the hearing within 45 days of the request. For good cause shown, the director may allow a continuance at the request of a party in interest.

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(a) With respect to any proceeding before him, the director may upon his own initiative or upon the request of any interested person or party direct the interested persons or parties to appear before the director at a specified time and place in order to simplify the issues presented or to take up any other matters which may tend to expedite or otherwise facilitate the disposition of the proceeding.

(b) All papers submitted to the director under this section shall be filed with the Department of Labor and Industries, General Administration Building, Olympia, Washington 98504. An original and four copies of all papers shall be submitted. Service under this part shall be by the filing party or interested person; service may be personal or may be by mail. Service by mail is complete on mailing.

(5) The final disposition shall be by the director.

(a) The director may decline review of any case whenever in his judgment a review would be inappropriate or because of the lack of timeliness, the nature of the relief sought, or other reasons.

(b) The director shall decide the case upon the basis of all relevant matter contained in the entire record before him but the director may utilize his experience, technical competence, and specialized knowledge in evaluating the evidence.

(c) Upon reasonable notice to the parties or interested persons, the director may vary the procedures specified in this part in particular cases.

(6) The director may allow all parties a period of ten days for filing post-hearing briefs prior to closing the record and concluding the hearing.

(7) The director shall issue a written decision within 30 days of the conclusion of the hearing. A copy shall be sent to each party in interest.

[Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex. s. c 38. 82-18-041 (Order 82-28), § 296-127-062, filed 8/27/82.]

WAC 296-127-130 Filing of complaint. Any interested party, as defined in RCW 39.12.010(4) may file with the department a complaint alleging a violation of the prevailing wage laws. The complaint must describe the alleged violation and identify the alleged violator. It would aid the department's investigation if the complaint also specifies:

- (1) The name and address of the complainant;
- (2) The address of the alleged violator;
- (3) The name and address of the public agency that awarded the contract;
- (4) The date the public agency accepted the completed public work (if applicable);
- (5) The specific rates of wages paid by the violator and the rates that allegedly should be paid;
- (6) The exact amount of prevailing wages that are alleged to remain unpaid; and
- (7) The date the bids were due on the public works project.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020, 86-03-063 (Order 85-28), § 296-127-130, filed 1/17/86.]

WAC 296-127-140 Investigation of complaint. (1) The department shall investigate a complaint filed by an interested party unless the complaint was filed more than thirty days after the date the public agency accepted the public

work that gave rise to the complaint. The department may, in its sole discretion, investigate a complaint filed more than thirty days after the acceptance date. However, the department may not charge a contractor with a violation of RCW 39.12.065 if the complaint is filed after the thirty-day limit.

The department's investigation shall determine whether a violation of RCW 39.12.065 or 39.12.050, or both, or of any other provision of chapter 39.12 RCW, occurred.

(2) If the department's investigation substantiates a complaint that alleges that a contractor has violated RCW 39.12.065, the department is required to attempt to collect unpaid wages for the contractor's employees. During the investigation, the department should be able to identify the affected employees. The department shall direct to the affected employees the best notice practicable under the circumstances, including individual notice to all employees who can be identified through reasonable effort. The notice shall inform the employee that (a) the department's final order, whether favorable or not, will apply to all employees; (b) any employee may, if he or she desires, move to intervene as a party in any hearing held as a result of the investigation; and (c) that the employee may have a private right of action to collect unpaid prevailing wages.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020, 86-03-063 (Order 85-28), § 296-127-140, filed 1/17/86.]

WAC 296-127-150 Notice of violation. (1) If the department determines after its investigation that there is reasonable cause to believe that the prevailing wage law has been violated, the department shall notify the violator of its determination. The notice of violation shall be served on the violator personally or by certified mail.

- (2) The notice of violation shall:
 - (a) Describe concisely the violation;
 - (b) Specify which statute or statutes were violated;
 - (c) If known, identify the laborers, workers, and mechanics who are affected by the violation;
 - (d) If known, state the amount of unpaid prevailing wages the violator owes;
 - (e) State that an employee cannot by contract or agreement waive the right to receive the prevailing wage;
 - (f) State the penalty that the department will assess for a violation, if any, of RCW 39.12.065 and 39.12.050; and
 - (g) State the date the complaint was filed with the department.

(3) RCW 39.12.065 and 39.12.050 establish the penalty amounts.

(4) If the notice alleges a violation of RCW 39.12.065, the department shall serve a copy of the notice of violation on the violator's sureties under chapters 39.08, 18.27, 19.28, and 60.28 RCW.

(5) The notice of violation shall inform the violator and, if a violation of RCW 39.12.065 is alleged, its sureties that they may request a hearing on the violations, the amount of unpaid prevailing wages owed, or the penalties assessed. The notice shall specify that if no hearing is requested within thirty days of the date of issuance of the notice the director shall issue a final, unappealable order finding that the violation did occur, ordering the violator to pay any unpaid prevailing wages, and assessing penalties.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-150, filed 1/17/86.]

WAC 296-127-160 Appeal of notice of violation. The violator or any of its sureties who are interested in the matter may request a hearing on a notice of violation. One original and four copies of the request must be filed with the director within thirty days after the date the department issued the notice. The party requesting the hearing must also serve a copy of the notice on all interested sureties and, if the requestor is a surety, on the violator.

The request for hearing must be in writing and must specify:

- (1) The name and address of the party requesting the hearing;
- (2) The notice of violation that is being appealed;
- (3) The items of the notice of violation that the requestor believes are erroneous; and
- (4) The reasons the notice of violation is erroneous.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-160, filed 1/17/86.]

WAC 296-127-170 Hearing on notice of violation. (1) The director may hear the appeal personally or may delegate the authority to hold the hearing and draft a proposed decision to an administrative law judge pursuant to chapter 34.12 RCW. The plaintiff in the hearing shall be the department, and the defendants shall be the violator and its interested sureties. The department shall have the burden of proving, by a preponderance of the evidence, that the violations occurred and that any wages were unpaid as stated in the notice.

(2) Any interested party may upon motion, be allowed to intervene as a plaintiff in the hearing. "Standing" shall be construed broadly to effectuate the remedial purposes of the prevailing wage law. An interested party, whether or not admitted as a plaintiff, may submit written arguments and affidavits. The parties shall be given an opportunity to respond to or rebut any arguments and affidavits before the person presiding over the hearing makes his or her decision.

(3) The hearing shall be conducted in accordance with the Uniform procedure rules, chapter 1-08 WAC.

(4) If the director presides over the hearing, the director shall issue a final decision that includes findings of fact and conclusions of law, and if appropriate an order to pay unpaid prevailing wages, a penalty, or both.

(5) If an administrative law judge presides over the hearing, she or he shall issue a proposed decision that includes findings of fact, conclusions of law, and if appropriate an order to pay unpaid prevailing wages, a penalty, or both. The proposed decision shall be served by certified mail or personally on the violator, the interested sureties, the department, and any interested parties who have intervened as plaintiffs. Any of these parties, if aggrieved by the proposed decision, may appeal to the director within thirty days after the date of issuance of the proposed decision. If none of the parties appeals within thirty days, the proposed decision may not be appealed either to the director or the courts.

(6) An appellant must file with the director an original and four copies of its notice of appeal. The notice of appeal must specify which findings and conclusions are erroneous.

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The appellant must attach to the notice the written arguments supporting its appeal.

The appellant must serve a copy of the notice of appeal and the arguments on the other parties. The respondent parties must file with the director their written arguments within thirty days after the date the notice of appeal and the arguments were served upon them.

(7) The director shall review the proposed decision in accordance with the Administrative Procedure Act, chapter 34.04 RCW. The director may: Allow the parties to present oral arguments as well as the written arguments; require the parties to specify the portions of the record on which the parties rely; require the parties to submit additional information by affidavit or certificate; remand the matter to the administrative law judge for further proceedings; and require a departmental employee to prepare a summary of the record for the director to review. The director shall issue a final decision that can affirm, modify, or reverse the proposed decision.

(8) The director shall serve the final decision on all parties. Any aggrieved party may appeal the final decision to superior court pursuant to RCW 34.04.130 unless the final decision affirms an unappealed proposed decision. If no party appeals within the period set by RCW 34.04.130, the director's decision is conclusive and binding on all parties.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-170, filed 1/17/86.]

WAC 296-127-180 Effect of final decision finding a violation of RCW 39.12.065. If the director issues a final decision that includes a finding that a contractor violated RCW 39.12.065 and that the contractor owes unpaid prevailing wages, and the finding is not timely appealed or is affirmed by the courts, the findings and the decision are res judicata in any action by the department or by any interested party who was a plaintiff at the hearing, against the contractor and its sureties to recover the unpaid prevailing wages. The findings and decision are not res judicata in any action by an interested party who was not a plaintiff at the hearing.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-180, filed 1/17/86.]

WAC 296-127-190 Filing of lien against retainage or bonds. (1) Upon receipt of a timely complaint that a contractor has violated RCW 39.12.065, and that the contractor owes unpaid prevailing wages, the department may file a lien against the retainage or bond obtained by the contractor under RCW 60.28.010.

(2) Upon issuance by the director of a final decision that finds that a contractor has violated RCW 39.12.065 or 39.12.050, and that sets a civil penalty for the violation, the department shall file liens for the penalty amount against the retainage and bonds the contractor obtained under RCW 39.12.065 (2)(c), 39.08.010, and 60.28.010.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-190, filed 1/17/86.]

WAC 296-127-200 Surety bond payable to director. (1) RCW 39.12.065 (2)(c) authorizes the director to require a contractor to obtain a surety bond "running to the director in the amount of the violation found." The intent and wording

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indicates that the director may require such a bond only after issuing a final decision finding that the contractor has violated RCW 39.12.065.

(2) The director may demand that a violating contractor post the bond when:

(a) The director has issued a final decision that finds that the contractor owes unpaid prevailing wages or a penalty, whether or not the decision has been appealed to the courts; and

(b) The retainage or bonds provided under RCW 60.28.010, 18.27.040, and 19.28.120 are or may be insufficient to pay the amount of prevailing wages or the penalty owed.

(3) A contractor may at any time voluntarily obtain a bond running to the director to guarantee the payment of the prevailing wages and any penalty. The contractor may allow the director to satisfy any claim for unpaid wages or the penalty from this bond instead of from the retainage or bonds obtained under RCW 60.28.010, 18.27.040, 19.28.120, and 39.08.010.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-200, filed 1/17/86.]

WAC 296-127-210 Suit against retainage and bonds.

(1) If the director issues a final decision that includes a finding that the contractor has violated RCW 39.12.065 or 39.12.050, and the finding is not timely appealed or is affirmed by the courts, the department may file suit against the appropriate retainage and bonds to recover the amount of unpaid prevailing wages or the civil penalty.

(2) The department may, before issuance of a final decision, file suit against the appropriate retainage and bonds to recover unpaid prevailing wages if the filing of a suit is necessary to preserve the claim. The suit shall be held in abeyance pending the exhaustion of administrative remedies.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-210, filed 1/17/86.]

WAC 296-127-220 Distribution of recovery. (1) Upon making a recovery pursuant to RCW 39.12.065(2) against a contractor's retainage or bonds, the department shall distribute the proceeds and any award of attorneys' fees and costs as follows:

(a) The recovery shall be paid to the employees of the violator who did not receive the correct prevailing wage. The distribution among employees shall be based on the evidence of wage loss produced at the hearing on the violation.

(b) Next shall be paid the costs the department incurred in making the recovery. The department shall pay these costs from the attorney's fees and costs awarded by the courts.

(2) A contractor who is the subject of an investigation or who has received a notice of violation may choose not to contest the matter and may tender to the department the amount of unpaid prevailing wages the department determines is owed. The department, after identifying and notifying the affected employees pursuant to WAC 296-127-140, shall accept the tender if the contractor in writing acknowledges that the department, by accepting the tendered amount, does not absolve the contractor from liability to any employee for unpaid prevailing wages.

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(3) If an employee for whom the department has recovered unpaid prevailing wages cannot be found, the department shall retain the wages for the one-year period required by RCW 63.29.150. After the statutory period has lapsed, the department shall pay the wages to the department of revenue in accordance with RCW 63.29.170.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-220, filed 1/17/86.]

WAC 296-127-300 Filing and service. All papers required to be filed with the director under this chapter or chapter 39.12 RCW shall be addressed to Director, Department of Labor and Industries, General Administration Building, Olympia, WA. 98504.

Filing and service shall be made as allowed by WAC 1-08-090 through 1-08-140.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-300, filed 1/17/86.]

WAC 296-127-310 List of violators. The department shall maintain a list of all contractors who are forbidden to bid on a public works project, or to have a bid accepted, pursuant to RCW 39.12.065(3) or 39.12.050. To the extent required by RCW 39.12.065(3) and 39.12.050, the industrial statistician shall refuse to certify any statement of intent to pay the prevailing wage or affidavit of wages paid that he or she determines was submitted by a contractor on the list. Because the department receives a large number of requests for certification, the department shall not be liable to any person or entity for certifying a statement or an affidavit of a contractor on the list.

The industrial statistician shall make the list available upon request.

[Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-310, filed 1/17/86.]

WAC 296-127-320 Payroll. (1) Each contractor shall keep accurate payroll records for three years from the date of acceptance of the public works project by the contract awarding agency, showing the name, address, Social Security number, trade or occupation, straight time rate, hourly rate of usual benefits as defined by WAC 296-127-014(1), and overtime hours worked each day and week, including any employee authorizations executed pursuant to WAC 296-127-022, and the actual rate of wages paid, for each laborer, worker, and mechanic employed by the contractor for work performed on a public works project.

(2) A contractor shall, within ten days after it receives a written request, from the department or from any interested party as defined by RCW 39.12.010(4), file a certified copy of the payroll records with the agency that awarded the public works contract and with the department.

(3) A contractor's noncompliance with this section shall constitute a violation of RCW 39.12.050.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 92-01-104, § 296-127-320, filed 12/18/91, effective 1/31/92. Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020. 86-03-063 (Order 85-28), § 296-127-320, filed 1/17/86.]

WAC 296-127-400 Applicability. WAC 296-127-400 through 296-127-470 are issued pursuant to RCW 39.12.022,

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authorizing the director of the department of labor and industries, to the extent necessary in order to prevent curtailment of opportunities for employment, to issue special subprevailing wage certificates for employment of individuals whose earning capacity is impaired by physical or mental deficiency or injury at wages lower than the prevailing rate applicable under RCW 39.12.020. Subprevailing wage certificates shall be subject to the conditions prescribed in these regulations.

[Statutory Authority: RCW 39.12.022, 90-19-061, § 296-127-400, filed 9/17/90, effective 10/18/90.]

WAC 296-127-410 Definitions. For the purposes of WAC 296-127-400 through 296-127-470:

(1) "Developmental disability" means a disability attributable to mental retardation, cerebral palsy, epilepsy, autism, or another neurological or other condition of an individual found by the secretary of social and health services to be closely related to mental retardation or to require treatment similar to that required for individuals with mental retardation, which disability originates before the individual attains age eighteen, which has continued or can be expected to continue indefinitely, and which constitutes a substantial handicap to the individual.

(2) "Handicapped worker" means an individual whose earning capacity for the work to be performed is impaired by physical or mental deficiency or injury.

(3) "Prevailing rate" means the prevailing rate of wage as defined in RCW 39.12.010 and as determined by the industrial statistician.

[Statutory Authority: RCW 39.12.022, 90-19-061, § 296-127-410, filed 9/17/90, effective 10/18/90.]

WAC 296-127-420 Application for a subprevailing wage certificate. (1) Nonprofit vocational rehabilitation programs may apply for a subprevailing wage certificate authorizing the employment of one or more handicapped workers with a developmental disability at less than the prevailing rate. An application for each worker shall be filed with the office of the industrial statistician not less than annually upon forms approved by the director or an authorized representative of the director.

(2) The application shall be signed jointly by the employer, the handicapped worker for whom such application is being made, and by the parent or guardian of the handicapped worker except as otherwise authorized by the director or an authorized representative of the director.

[Statutory Authority: RCW 39.12.022, 90-19-061, § 296-127-420, filed 9/17/90, effective 10/18/90.]

WAC 296-127-430 Conditions for granting a subprevailing wage certificate. (1) A subprevailing wage certificate may be issued to a nonprofit vocational rehabilitation program if the application is in proper form and sets forth facts showing:

(a) A wage below prevailing rate is necessary to prevent curtailment of the handicapped worker's opportunities for employment;

(b) The handicap impairs the earning capacity of the worker for the work to be performed;

(c) The percentage of full productivity at which the handicapped worker functions; and

(d) A description of the duties to be performed by each handicapped worker;

(e) The nature of the disability; and

(f) An addendum containing a detailed explanation of the nature of the disability.

(2) The industrial statistician shall not require a nonprofit vocational rehabilitation program to provide the information required in subsection (1)(f) of this section if it provides a notarized copy of a federal certificate granted by the United States department of labor under section 14(c) of the Federal Fair Labor Standards Act and any documentation deemed necessary by the industrial statistician identifying the workers with a developmental disability, a description of the duties to be performed, and the percentage of productivity at which each worker functions.

(3) The director or an authorized representative of the director may require the submission of additional information to that required by subsection (1) or (2) of this section shown on the application and may require the handicapped worker to take a medical examination where it is deemed necessary in order to determine whether or not the issuance of a certificate is justified.

[Statutory Authority: RCW 39.12.022, 90-19-061, § 296-127-430, filed 9/17/90, effective 10/18/90.]

WAC 296-127-440 Issuance of a subprevailing wage certificate. If the application and other available information indicate that the requirements of this regulation are satisfied, the director or an authorized representative of the director may issue a subprevailing wage certificate. If issued, copies of the subprevailing wage certificate shall be mailed to the employer, the handicapped worker, and to the parent or guardian of the handicapped worker. If denied, the employer, the handicapped worker, and the parent or guardian of the handicapped worker shall be given written notice of the denial.

[Statutory Authority: RCW 39.12.022, 90-19-061, § 296-127-440, filed 9/17/90, effective 10/18/90.]

WAC 296-127-450 Terms of subprevailing wage certificate. (1) A subprevailing wage certificate shall specify, among other things, the names of the handicapped workers, the name of the employer, the duties to be performed by the handicapped worker, the percentage of the prevailing rate authorized to be paid, and the period of time during which that percentage of the prevailing rate may be paid. A certificate shall also indicate that the percentage of the prevailing rate to be paid a handicapped worker shall change to reflect an increase or decrease in the worker's productivity when the worker's productivity is determined to change.

(2) A subprevailing wage certificate shall be effective for a period of one year or less as designated by the director or an authorized representative of the director. A handicapped worker employed under such certificate may be paid at the specified percentage of the prevailing rate only during the effective period of the certificate.

(3) Notwithstanding the requirements of chapter 49.46 RCW and its administrative regulations, the percentage of the prevailing rate authorized to be paid shall be fixed at a figure

designed to reflect adequately the percentage of productivity at which the handicapped worker functions.

(4) Any money received by a handicapped worker by reason of any state or federal pension or compensation program for handicapped persons shall not be considered as offsetting any part of the wage or remuneration due the handicapped worker by the employer.

(5) A handicapped worker shall be paid not less than one and one-half times the rate specified in the subprevailing wage certificate for hours worked in excess of forty hours per workweek or eight hours per day.

(6) The terms of any subprevailing wage certificate, including the percentage of the prevailing rate authorized to be paid, may be amended by the director or an authorized representative of the director upon written notice to the parties concerned, if the facts justify such amendment.

[Statutory Authority: RCW 39.12.022. 90-19-061, § 296-127-450, filed 9/17/90, effective 10/18/90.]

WAC 296-127-460 Renewal of subprevailing wage certificate. Application for renewal of any subprevailing wage certificate shall be filed in the same manner as an original application. An application for renewal shall include the most recent evaluation conducted within the past year of the productivity level at which the handicapped worker functions. If such application has been filed prior to the expiration date of the certificate, the certificate shall remain in effect until the application for renewal has been granted or denied.

[Statutory Authority: RCW 39.12.022. 90-19-061, § 296-127-460, filed 9/17/90, effective 10/18/90.]

WAC 296-127-470 Review. Any person aggrieved by any action of the director or an authorized representative of the director taken pursuant to this regulation may, within fifteen days after notice of such action has been mailed, file with the director a petition for review of the action complained of, setting forth grounds for seeking such review. If reasonable grounds exist, the director or an authorized representative of the director may grant such review and to the extent deemed appropriate afford all interested persons an opportunity to be heard on such review.

[Statutory Authority: RCW 39.12.022. 90-19-061, § 296-127-470, filed 9/17/90, effective 10/18/90.]

WAC 296-127-990 Severability. If any provision of this chapter or its application to any persons or circumstances is held invalid by state or federal court, the remainder of the chapter or the application of the provision to other persons or circumstances is not affected.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 92-01-104, § 296-127-990, filed 12/18/91, effective 1/31/92.]

**Chapter 296-128 WAC
MINIMUM WAGES**

WAC

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Counselor staff occupations in organized seasonal recreational camps—Women and minors. [Industrial Welfare Order 11-63, filed 9/13/63; Minimum Wage and Welfare Order 54, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.

296-128-415	Food processing industry—Women and minors. [Industrial Welfare Order 5-62, filed 11/25/64; Minimum Wage and Welfare Order 51, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.	296-128-4462	Separability. [Order 71-5, § 296-128-4462, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-420	Fresh fruit and vegetable packing industry—Women and minors. [Industrial Welfare Order 6-62, filed 11/25/64; Minimum Wage and Welfare Order 52, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.	296-128-4463	Penalties. [Order 71-5, § 296-128-4463, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-425	General amusement and recreation industry—Women and minors. [Industrial Welfare Order 8-62, filed 11/25/64; Minimum Wage Order 45-A, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgated, see chapter 296-125 WAC.	296-128-450	Office workers—Women and minors. [Industrial Welfare Order 13-63, filed 11/25/64; Minimum Wage Order 43, filed 3/23/60; Statement of interpretation of applicability of Industrial Welfare Committee Order 13-63, office workers, filed 11/25/64.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-430	Health care industry—Women and minors. [Industrial Welfare Order 68-3, filed 5/8/68, effective 7/15/68; Industrial Welfare Order 10-62, filed 11/25/64; Minimum Wage Order 46, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.	296-128-455	Personal service industry—Women and minors. [Industrial Welfare Order 4-62, filed 11/25/64.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-435	Laundry, dry-cleaning and dye works industry—Women and minors. [Industrial Welfare Order 3-62, filed 11/25/64; Minimum Wage and Welfare Order 48, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.	296-128-460	Public housekeeping industrial—Women and minors. [Order 71-5 (Industrial Welfare Order No. 9-71), § 296-128-460, filed 5/26/71, effective 7/1/71; Industrial Welfare Order 9-62, filed 11/25/64; Minimum Wage Order 46, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-440	Manufacturing industry and general working conditions—Women and minors. [Industrial Welfare Order 2-62, filed 11/25/64; Minimum Wage and Welfare Order 50, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.	296-128-4601	Applicability. [Order 71-5, § 296-128-4601, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-445	Mercantile industry, wholesale and retail—Women and minors. [Order 71-5, § 296-128-445, filed 5/26/71, effective 7/1/71, Mercantile Industrial Welfare Order 1-71; Industrial Welfare Order 1-62, filed 11/25/64; Minimum Wage Order 44, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.	296-128-4602	Definitions. [Order 71-5, § 296-128-4602, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-4451	Applicability. [Order 71-5, § 296-128-4451, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.	296-128-4603	Minimum wages. [Order 71-5, § 296-128-4603, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-4452	Definitions. [Order 71-5, § 296-128-4452, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.	296-128-4604	Deductions. [Order 71-5, § 296-128-4604, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-4453	Minimum wages. [Order 71-5, § 296-128-4453, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.	296-128-4605	Statements furnished. [Order 71-5, § 296-128-4605, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-4454	Deductions. [Order 71-5, § 296-128-4454, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.	296-128-4606	Records. [Order 71-5, § 296-128-4606, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-4455	Statements furnished. [Order 71-5, § 296-128-4455, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.	296-128-4607	Meals and lodging. [Order 71-5, § 296-128-4607, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-4456	Records. [Order 71-5, § 296-128-4456, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.	296-128-4608	Meal and rest periods. [Order 71-5, § 296-128-4608, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-4457	Meal and rest periods. [Order 71-5, § 296-128-4457, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.	296-128-4609	Working conditions. [Order 71-5, § 296-128-4609, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-4458	Working conditions. [Order 71-5, § 296-128-4458, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.	296-128-461	Uniforms. [Order 71-5, § 296-128-461, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-4459	Uniforms. [Order 71-5, § 296-128-4459, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.	296-128-4611	Minor work permits. [Order 71-5, § 296-128-4611, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-446	Minor work permits. [Order 71-5, § 296-128-446, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.	296-128-4612	Posting of order. [Order 71-5, § 296-128-4612, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
296-128-4461	Posting of order. [Order 71-5, § 296-128-4461, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.	296-128-4613	Separability. [Order 71-5, § 296-128-4613, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
		296-128-4614	Penalties. [Order 71-5, § 296-128-4614, filed 5/26/71, effective 7/1/71.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
		296-128-465	Telephone and telegraph industry—Women and minors. [Industrial Welfare Order 12-63, filed 11/25/64; Mini-

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Minimum Wage and Welfare Order 53, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.
Theatrical amusement and recreation industry—Women and minors. [Industrial Welfare Order 7-62, filed 11/25/64; Minimum Wage Order 45, filed 3/23/60.] Repealed by Order 77-32, filed 12/30/77. Later promulgation, see chapter 296-125 WAC.

RECORDKEEPING PROVISIONS

WAC 296-128-010 Records required. For all employees who are subject to RCW 49.46.020, employers shall be required to keep and preserve payroll or other records containing the following information and data with respect to each and every employee to whom said section of said act applies:

(1) Name in full, and on the same record, the employee's identifying symbol or number if such is used in place of name on any time, work, or payroll records. This shall be the same name as that used for Social Security record purposes;

(2) Home address;

(3) Occupation in which employed;

(4) Date of birth if under 18;

(5) Time of day and day of week on which the employee's workweek begins. If the employee is part of a workforce or employed in or by an establishment all of whose workers have a workweek beginning at the same time on the same day, a single notation of the time of the day and beginning day of the workweek for the whole workforce or establishment will suffice. If, however, any employee or group of employees has a workweek beginning and ending at a different time, a separate notation shall then be kept for that employee or group of employees;

(6) Hours worked each workday and total hours worked each workweek (for purposes of this section, a "workday" shall be any consecutive 24 hours);

(7) Total daily or weekly straight-time earnings or wages; that is, the total earnings or wages due for hours worked during the workday or workweek, including all earnings or wages due during any overtime worked, but exclusive of overtime excess compensation;

(8) Total overtime excess compensation for the workweek; that is, the excess compensation for overtime worked which amount is over and above all straight-time earnings or wages also earned during overtime worked;

(9) Total additions to or deductions from wages paid each pay period. Every employer making additions to or deductions from wages shall also maintain a record of the dates, amounts, and nature of the items which make up the total additions and deductions;

(10) Total wages paid each pay period;

(11) Date of payment and the pay period covered by payment;

(12) Employer may use symbols where names or figures are called for so long as such symbols are uniform and defined.

[Regulation 294.7.001 (part), filed 12/30/60.]

WAC 296-128-011 Special recordkeeping requirements. (1) In addition to the records required by WAC 296-128-010, employers who employ individuals as truck or bus drivers subject to the provisions of the Federal Motor Carrier

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Act shall maintain records indicating the base rate of pay, the overtime rate of pay, the hours worked by each employee for each type of work, and the formulas and projected work hours used to substantiate any deviation from payment on an hourly basis pursuant to WAC 296-128-012. The records shall indicate the period of time for which the base rate of pay and the overtime rate of pay are in effect.

For the purposes of this section and WAC 296-128-012, "base rate of pay" means the amount of compensation paid per hour or per unit of work in a workweek of forty hours or less. A base rate of pay shall be established in advance of the work performed and may be based on hours or work units such as mileage, performance of specified duties, or a specified percentage of the gross proceeds charged for specified work. A base rate of pay shall not be established that will result in compensation at less than the minimum wage prescribed in RCW 49.46.020. "Overtime rate of pay" means the amount of compensation paid for hours worked within the state of Washington in excess of forty hours per week and shall be at least one and one-half times the base rate of pay.

(2) The records required by this section shall be made available by the employer at the request of the department. Any current or past employee may obtain copies of the formula, the base rate of pay, the overtime rate of pay, and that employee's records. Job applicants seeking employment by the employer as truck or bus drivers subject to the provisions of the Federal Motor Carrier Act, may obtain copies of the formula, the base rate of pay, and the overtime rate of pay.

[Statutory Authority: RCW 43.22.270, 49.46.130 and 1989 c 104. 89-22-120, § 296-128-011, filed 11/1/89, effective 12/2/89.]

WAC 296-128-012 Overtime for truck and bus drivers. (1)(a) The compensation system under which a truck or bus driver subject to the provisions of the Federal Motor Carrier Act is paid shall include overtime pay at least reasonably equivalent to that required by RCW 49.46.130 for working within the state of Washington in excess of forty hours a week. To meet this requirement, an employer may, with notice to a truck or bus driver subject to the provisions of the Federal Motor Carrier Act, establish a rate of pay that is not on an hourly basis and that includes in the rate of pay compensation for overtime. An employer shall substantiate any deviation from payment on an hourly basis to the satisfaction of the department by using the following formula or an alternative formula that, at a minimum, compensates hours worked within the state of Washington in excess of forty hours per week at an overtime rate of pay and distributes the projected overtime pay over the average number of hours projected to be worked. The following formula is recommended for establishing a uniform rate of pay to compensate work that is not paid on an hourly basis and for which compensation for overtime is included:

1. Define work unit first. E.g., miles, loading, unloading, other.

[Title 296 WAC—p. 1977]

- 2. Average number of work units = Average number of work units accomplished per week

per hour = Average number of hours projected to be worked per week
- 3. Weekly Base Rate = Number of units per hour x 40 hours x base rate of pay
- 4. Weekly Overtime rate = Number of units per hour x number of hours over 40 x overtime rate of pay
- 5. Total weekly pay = Weekly base rate plus weekly overtime rate
- 6. Uniform rate of pay = $\frac{\text{Total weekly pay}}{\text{Total work units}}$

Example: A truck driver is paid on a mileage basis for a two hundred thirty mile trip performed about ten times a week. The base rate of pay is twenty cents a mile. The overtime rate of pay is thirty cents a mile. The average length of the trip is four and one-half hours.

- 1. $\frac{2300 \text{ mi.}}{\text{per week}} \div \frac{45 \text{ hours}}{\text{per week}} = \frac{51.1 \text{ miles}}{\text{per hour}}$
- 2. (a) $51.1 \text{ miles/hour} \times 40 \text{ hours} \times .20/\text{mile} = \408.80
 (b) $51.1 \text{ miles/hour} \times 5 \text{ hours} = 255.5 \text{ miles}$
 (c) $255.5 \text{ miles} \times .30/\text{mile} = \76.65
 (d) $\$408.80 \text{ plus } \$76.65 = \$485.45 \text{ divided by } 2300 \text{ miles} = 21.1 \text{ cents mile}$

(b) In using a formula to determine a rate of pay, the average number of hours projected to be worked and the average number of work units accomplished per week shall reflect the actual number of hours worked and work units projected to be accomplished by persons performing the same type of work over a representative time period within the past two years consisting of at least twenty-six consecutive weeks.

(c) The department may evaluate alternative rates of pay and formulas used by employers in order to determine whether the rates of pay established under this section result in the driver receiving compensation reasonably equivalent to one and one-half times the base rate of pay for actual hours worked within the state of Washington in excess of forty hours per week.

(2) Where an employee receives a different base rate of pay depending on the type of work performed, the rate that is paid or used for hours worked within the state of Washington in excess of forty hours per week shall be at least the overtime rate of pay for the type of work in which most hours were worked.

[Statutory Authority: RCW 43.22.270, 49.46.130 and 1989 c 104. 89-22-120, § 296-128-012, filed 11/1/89, effective 12/2/89.]

WAC 296-128-015 Definitions of workday and workweek. (1) A workweek is a fixed and regularly recurring period of 168 hours or seven consecutive 24 hour periods. It may begin on any day of the week and any hour of the day, and need not coincide with a calendar week.

[Title 296 WAC—p. 1978]

(2) A workday is a fixed and regularly recurring period of 24 hours. It may begin at any hour of a calendar day and must begin at the same time each calendar day.

[Regulation 294.7.001 (part), filed 12/30/60.]

WAC 296-128-020 Term for keeping records. Unless otherwise specifically authorized by the director all records required under WAC 296-128-010 shall be kept for a period of at least three years.

[Regulation 294.7.001 (part), filed 12/30/60.]

WAC 296-128-025 Place for keeping records and availability for inspection. Each employer shall keep the records required by this regulation safe and accessible at the place or places of employment or at one or more established central recordkeeping offices where such records are customarily maintained. All such records shall be open at any time to inspection and transcription or copying by the director and his duly authorized representative and to the employee, upon request for that employee's work record, at any reasonable time.

[Statutory Authority: RCW 43.22.270, 49.12.020, 49.12.091, 49.12.050, 49.46.020 and 49.46.070. 89-22-016 (Order 89-16), § 296-128-025, filed 10/24/89, effective 11/24/89; Regulation 294.7.001 (part), filed 12/30/60.]

WAC 296-128-030 Petitions for exceptions. (1) **Submission of petitions for relief.** Any employer or group of employers who, due to peculiar conditions under which he or they must operate, desires authority to maintain records in a manner other than required in this regulation, or to be relieved of preserving certain records for the period specified in the regulation, may submit a written petition to the director setting forth the authority desired and the reasons therefor.

(2) **Action on petitions.** If, on review of the petition and after completion of any necessary investigation supplementary thereto, the director shall find that the authority prayed for, if granted, will not hamper or interfere with enforcement of the provisions of the act or any regulation or orders issued thereunder, he may then grant such authority but limited by such conditions as he may determine are requisite, and subject to subsequent revocation. Where the authority granted hereunder is sought to be revoked for failure to comply with the conditions determined by the director to be requisite to its existence, the employer or groups of employers involved shall be notified in writing of the facts constituting such failure and afforded an opportunity to achieve or demonstrate compliance.

(3) **Compliance after submission of petitions.** The submission of a petition or the delay of the director in acting upon such petition shall not relieve any employer or group of employers from any obligations to comply with all the requirements of the regulations in this part applicable to him or them. However the director shall give notice of the denial of any petition with due promptness.

[Regulation 294.7.001 (part), filed 12/30/60.]

WAC 296-128-035 Payment interval. All wages due shall be paid at no longer than monthly intervals to each employee on established regular pay days. To facilitate book-keeping, an employer may implement a regular payroll sys-

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tem in which wages from up to seven days before pay day may be withheld from the pay period covered and included in the next pay period.

[Statutory Authority: RCW 43.22.270, 49.12.020, 49.12.091, 49.12.050, 49.46.020 and 49.46.070. 89-22-016 (Order 89-16), § 296-128-035, filed 10/24/89, effective 11/24/89.]

HANDICAPPED WORKERS

WAC 296-128-050 Applicability of this regulation.

This regulation is issued pursuant to RCW 49.46.060, Washington minimum wage and hour law, which authorized the director of the department of labor and industries, to the extent necessary in order to prevent curtailment of opportunities for employment, to issue special certificates for employment of individuals whose earning capacity is impaired by age or physical or mental deficiency or injury at wages lower than the minimum wage applicable under RCW 49.46.020. Such certificates shall be subject to the conditions prescribed in this regulation.

[§ 1, Regulation 294.6.005, filed 12/30/60.]

WAC 296-128-055 Definition. "Handicapped worker" means an individual whose earning capacity is impaired by age or physical or mental deficiency or injury for the work he is to perform.

[§ 2, Regulation 294.6.005, filed 12/30/60.]

WAC 296-128-060 Application for certificate. (1) Application for a certificate authorizing the employment of handicapped workers shall be made upon forms made available by the director or his authorized representatives.

(2) The application shall set forth, among other things, the nature of the disability, a description of the occupation at which the handicapped worker is to be employed, and the wage the employer proposes to pay the handicapped worker per hour. The nature of the disability must be set out in detail.

(3) The application shall be signed jointly by the employer and the handicapped worker for whom such application is being made, except as otherwise authorized by the director or his authorized representative.

[§ 3, Regulation 294.6.005, filed 12/30/60.]

WAC 296-128-065 Conditions for granting a certificate. (1) If the application is in proper form and sets forth facts showing:

(a) A subminimum wage is necessary to prevent curtailment of the handicapped worker's opportunities for employment;

(b) the handicap impairs the earning capacity of the worker for the work he is to perform, a certificate may be issued.

(2) The director or his authorized representative may require the submission of additional information to that shown on the application and may require the handicapped worker to take a medical examination where it is deemed necessary in order to determine whether or not the issuance of a certificate is justified.

[§ 4, Regulation 294.6.005, filed 12/30/60.]

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WAC 296-128-070 Issuance of certificate. If the application and other available information indicate that the requirements of this regulation are satisfied, the director or his authorized representative shall issue a certificate. Otherwise he shall deny a certificate. If issued, copies of the certificate shall be mailed to the employer and the handicapped worker and if denied, the employer and the handicapped worker shall be given written notice of the denial.

[§ 5, Regulation 294.6.005, filed 12/30/60.]

WAC 296-128-075 Terms of certificate. (1) A certificate shall specify, among other things, the name of the handicapped worker, the name of the employer, the occupation in which the handicapped worker is to be employed, the authorized subminimum wage rate and the period of time during which such wage rate may be paid.

(2) A certificate shall be effective for a period to be designated by the director or his authorized representative and a handicapped worker employed under such certificate may be paid subminimum wages only during the effective period of the certificate.

(3) The wage rate set in the certificate shall be fixed at a figure designed to reflect adequately the handicapped worker's earning capacity. No wage rate shall be fixed at less than 75 percent of the applicable minimum wage under RCW 49.46.020 unless, after investigation a lower rate appears to be clearly justified.

(4) Any money received by a handicapped worker by reason of any state or federal pension or compensation program for handicapped persons shall not be considered as offsetting any part of the wage or remuneration due the handicapped worker by the employer.

(5) The worker or trainee shall be paid not less than one and one-half times the regular rate for hours worked in excess of 40 in the workweek or 8 in the workday.

(6) The terms of any certificate, including the subminimum wage rate specified therein, may be amended by the director or his authorized representative upon written notice to the parties concerned, if the facts justify such amendment.

[§ 6, Regulation 294.6.005, filed 12/30/60.]

WAC 296-128-080 Renewal of certificate. Application for renewal of any certificate shall be filed in the same manner as an original application. If such application has been filed prior to the expiration date of the certificate, the certificate shall remain in effect until the application for renewal has been granted or denied.

[§ 7, Regulation 294.6.005, filed 12/30/60.]

WAC 296-128-085 Review. Any person aggrieved by any action of the director or his authorized representative taken pursuant to this regulation may, within 15 days after notice of such action has been mailed, file with the director a petition for review of the action complained of, setting forth grounds for seeking such review. If reasonable grounds exist, the director or his authorized representative may grant such review and to the extent deemed appropriate afford all interested persons an opportunity to be heard on such review.

[§ 8, Regulation 294.6.005, filed 12/30/60.]

WAC 296-128-090 Amendment of this regulation.

Any person desiring revision of any of the terms of this regulation may submit in writing to the director a petition setting forth the changes desired and the reasons for proposing them. If the director believes that reasonable cause for amendment of this regulation is set forth he will schedule a hearing in accordance with RCW 49.46.080.

[§ 9, Regulation 294.6.005, filed 12/30/60.]

EMPLOYMENT OF LEARNERS

WAC 296-128-100 Authority. This regulation is promulgated in accordance with RCW 49.46.060.

[§ 1, Regulation 294.6.003, filed 3/23/60.]

WAC 296-128-105 Definitions. As used in this regulation:

(1) A "learner" is a worker whose total experience in an authorized learner occupation is less than the period of time allowed as a learning period for that occupation in a learner certificate issued pursuant to these regulations.

(2) An "experienced worker" is a worker whose total experience in an authorized learner occupation is at least equal to the period of time allowed as a learning period for that occupation in a learner certificate issued pursuant to these regulations.

(3) "Experienced worker available for employment" means an experienced worker residing within the area from which the employer customarily draws its labor supply or within a reasonable commuting distance of such area, and who is willing and able to accept employment with the employer; or an experienced worker residing outside of the area from which the employer customarily draws its labor supply, who has in fact made himself available for employment.

[§ 2, Regulation 294.6.003, filed 3/23/60.]

WAC 296-128-110 Application for learner certificate.

(1) Whenever the employment of learners at wages lower than the minimum wage applicable under RCW 49.46.020 is believed necessary to prevent curtailment of opportunities for employment by a specified employer, an application for a certificate authorizing the employment of such learners at subminimum wage rates may be filed by the employer with the director of the department of labor and industries or his authorized representative.

(2) Application must be made on the official form provided by the department and furnish all information called for on said form.

(3) Separate application must be made with respect to each establishment or place of business operated by the applicant and in which he desires to employ learners at subminimum wage rates.

[§ 3, Regulation 294.6.003, filed 3/23/60.]

WAC 296-128-115 Procedure for action upon an application. (1) Upon receipt of an application for a learner certificate or renewal of such certificate the director or his authorized representative shall consider all relevant facts and, subject to the conditions specified in WAC 296-128-120,

shall issue or deny a learner certificate or, in appropriate circumstances, provide an opportunity to interested parties to present their views on the application prior to granting or denying a learner certificate.

(2) If a learner certificate is granted, notice of such fact and the terms of the certificate shall be posted at the employer's place of business for 15 days after receipt thereof and any interested person may file with the director written requests for reconsideration or review. Such application should set forth the applicant's interest in the review and the reasons he seeks review.

(3) If a learner certificate is denied, notice of such denial shall be mailed to the employer and it shall be without prejudice to the subsequent filing of an application.

[§ 4, Regulation 294.6.003, filed 3/23/60.]

WAC 296-128-120 Conditions governing issuance of learner certificates. The following conditions shall govern the issuance of a special certificate authorizing the employment of learners at subminimum wage rates:

(1) An adequate supply of qualified experienced workers is not available for employment; the experienced workers presently employed in occupations in which learners are requested, are afforded an opportunity for full time employment; learners are available for employment; and the granting of a certificate is necessary to prevent curtailment of employment opportunities.

(2) Reasonable efforts have been made to obtain experienced workers, including the placement of an order with the employment security office of the state of Washington.

(3) The issuance of a learner certificate will not tend to create unfair competitive labor cost advantages nor have the effect of impairing or depressing wage or working standards established for experienced workers for work of a like or comparable character in the industry.

(4) Abnormal labor conditions such as a strike, lock-out or other similar condition do not exist at the place of business for which a learner certificate is requested.

(5) There are no serious outstanding violations of the provisions of learner certificates previously issued to the employer, nor have there been any serious violations of the Washington Minimum Wage and Hour Act which provide reasonable grounds to believe that the terms of a certificate may not be complied with.

(6) The occupation or occupations in which learners are to receive training require a sufficient degree of skill to necessitate an appreciable training period.

(7) Learners shall be afforded every reasonable opportunity for continued employment upon completion of the learning period.

(8) Unless otherwise specified in the learner certificate, a learning program shall not exceed 480 hours of employment, and the total hours worked in any establishment by learners shall not exceed 10 percent of the total hours normally worked by experienced workers in such establishment: *Provided*, That where less than 10 experienced workers are employed by an employer, a learner certificate may authorize the employment of learners for a maximum of 40 hours per week under a bona fide learner program.

[§ 5, Regulation 294.6.003, filed 3/23/60.]

WAC 296-128-125 Terms and conditions of employment under learner certificates. (1) A learner certificate, if issued, shall specify, among other things:

- (a) The number or proportion of learners authorized to be employed on any one day;
- (b) The occupations in which learners may be employed;
- (c) The subminimum wage rates permitted for each learner occupation during the authorized learning period; which shall not be less than 85 percent of the minimum wage specified in RCW 49.46.020, as it may be amended, unless otherwise specified in the certificate;
- (d) The learning period for each authorized learner occupation;
- (e) The effective and expiration dates of the certificate.

(2) A learner certificate may be issued for a period of not longer than one year. A renewal certificate will not be issued without a clear showing that conditions set forth in WAC 296-128-120 still prevail.

(3) Learners hired pursuant to a learner certificate prior to the date on which such certificate expires may be continued in employment at the authorized subminimum wage rate for the duration of their authorized learning period even though the certificate expired before the learning period is completed.

(4) A copy of the learner certificate shall be posted by the employer during its effective period in a conspicuous place in the department where learners are to be employed.

(5) No learner shall be hired under a learner certificate if, at the time the employment begins, experienced workers capable of equaling the performance of a worker of minimum acceptable skill are available for employment.

(6) No learner shall be hired under a learner certificate while abnormal labor conditions exist such as a strike, lock-out, or other similar conditions in the place of business for which a learner certificate has been issued.

(7) The number of hours of previous employment in a learner occupation for which the learner has been hired must be deducted from the authorized learning period if within the three years immediately preceding the hiring of such learner he has been employed in the learner occupation for less than the total number of hours authorized as a learning period and shall also be deducted from the authorized learning period all hours spent in pertinent training in a vocational training school on the occupation for which the learner has been employed.

(8) No provision of any learner certificate will excuse noncompliance with higher standards applicable to learners which may be established under any other state law, federal law, or trade union agreement.

(9) Unless otherwise specified in the learner certificate a learning program shall not exceed 480 hours of employment and the total hours worked in any establishment by learners shall not exceed 10 percent of the total hours normally worked by experienced workers in such establishment: *Provided*, That where less than 10 experienced workers are employed by an employer a learner certificate may authorize the employment of learners for a maximum of 40 hours per week under a bona fide learner program.

[§ 6, Regulation 294.6.003, filed 3/23/60.]

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WAC 296-128-130 Records to be kept by employers of learners. The director or his authorized representative may specify additional records to be kept by employers of learners as a condition to compliance with the learner certificate.

[§ 7, Regulation 294.6.003, filed 3/23/60.]

WAC 296-128-135 Amendment and revocation of learner certificate. The director may amend or revoke a learner certificate when it is necessary by reason of changes in these regulations, or where the employer has violated its terms, or where the certificate was obtained by misleading or false statements, or where changed conditions warrant it in the opinion of the director.

[§ 8, Regulation 294.6.003, filed 3/23/60.]

WAC 296-128-140 Supplemental regulations. (1) Upon application of any person or persons, representing any industry or branch thereof, or upon his own motion, the director, if he deems it advisable, may, after appropriate and timely notice to interested parties, cause a hearing to be held to determine the need for employment of learners at wages lower than the minimum wage applicable under RCW 49.46.020 in order to prevent curtailment of employment opportunities in any industry or branch thereof; and if such need is found to exist, determine the occupations which require a learning period and the limitations as to wages, time, number, proportion, and length of learning period. Such hearing shall be held before the director or his duly authorized representative. Following such hearing the director may, by supplemental regulations, prescribe the conditions under which special certificates shall be issued for the employment of learners in such industry or branch thereof, if he finds that there is a need therefor to prevent curtailment of opportunities for employment.

(2) At such hearing the director may cause to be brought before him or his authorized representative any witness whose testimony he deems material to the subject matter before him.

[§ 9, Regulation 294.6.003, filed 3/23/60.]

WAC 296-128-145 Reconsideration and review. (1) Any person aggrieved by the action of the director or his authorized representative denying or granting a learner certificate may within 15 days after mailing of notice of such action file a written request for reconsideration with the director.

(2) A request for a reconsideration shall be accompanied by a statement of the additional evidence which the applicant believes may materially affect the decision.

(3) A request for review shall be granted where reasonable grounds are set forth in the request and if such review is granted all interested persons shall be afforded an opportunity to be heard.

[§ 10, Regulation 294.6.003, filed 3/23/60.]

WAC 296-128-150 Procedure for amendment. The director may at any time upon his own motion or upon written request of any interested persons setting forth reasonable grounds therefor amend or revoke any of the terms of this

regulation or of any supplemental regulations promulgated in accordance with WAC 296-128-140 after hearing as provided in RCW 49.46.080.

[§ 11, Regulation 294.6.003, filed 3/23/60.]

STUDENT LEARNERS

WAC 296-128-175 Applicability of the regulation.

This regulation is issued in accordance with RCW 49.46.060, to provide for the employment under special certificates of student learners at wages less than the minimum provided in RCW 49.46.020, in order to prevent curtailment of opportunities for employment. Such certificates shall be subject to the terms and conditions hereinafter set forth.

[§ 1, Regulation 294.6.004, filed 3/23/60.]

WAC 296-128-180 Definitions. (1) A "student learner" is a student who is receiving instruction in an accredited school, college, or university, and who is employed on a part-time basis in a bona fide vocational training program, or in a job-training program established by an accredited school and approved by the director of the department of labor and industries.

(2) A "bona fide vocational training program" is one authorized and approved by the state board of vocational education and provides for part-time employment which may be scheduled for part of the workday or workweek, for alternating weeks or for other limited periods during the year, supplemented by and integrated with a definitely organized plan of instruction designed to teach technical knowledge or related industrial information given as a regular part of the student learner's course by an accredited school, college, or university.

[§ 2, Regulation 294.6.004, filed 3/23/60.]

WAC 296-128-185 Application for certificate. (1)

Whenever the employment of a student learner at wages lower than the minimum wage applicable under RCW 49.46.020 is believed necessary to prevent curtailment of opportunities for employment, an application for a special certificate authorizing the employment of such student learner at subminimum wages shall be filed by the employer with the director of the department of labor and industries or his authorized representative.

(2) Application shall be on forms furnished by the department of labor and industries and must be signed by the employer, an appropriate school official and the student learner. Such application shall, among other things, show: The nature of the training program; the total number of workers employed by the employer; the number and hourly wage rate of experienced workers employed in the occupation in which the student learner is to be trained; the hourly wage rate or progressive wage schedule which the employer proposes to pay the student learner; the age of the student learner; the period of employment training at subminimum wages; the number of hours of employment training a week; the number of hours of school instruction a week.

[§ 3, Regulation 294.6.004, filed 3/23/60.]

[Title 296 WAC—p. 1982]

WAC 296-128-190 Procedure for action upon application. (1) Upon receipt of application for the employment of a student learner the director or his authorized representative shall either issue a special certificate or deny the application. To the extent deemed necessary the director or his authorized representative may provide an opportunity to interested persons to be heard on the application prior to granting or denying it.

(2) If a special certificate is issued it shall be mailed to the employer and a copy of it shall be mailed to the school official who signs the application.

[§ 4, Regulation 294.6.004, filed 3/23/60.]

WAC 296-128-195 Conditions governing issuance of special student learner certificate. The following conditions must be satisfied before a special certificate may be issued authorizing employment of student learners at subminimum wages:

(1) Any training program under which the student learner will be employed must be a bona fide vocational training program as defined in WAC 296-128-180 or be a part of a job-training program established by the governing body of the school and approved by the director of the department of labor and industries.

(2) The employment of the student learner at subminimum wages must be necessary to prevent curtailment of opportunities for employment.

(3) The occupation for which the student learner is receiving preparatory training must require a sufficient degree of skill to necessitate a substantial learning period.

(4) The employment of a student learner must not have the effect of displacing a worker employed in the establishment in which the student learner is to be employed.

(5) The employment of the student learner at subminimum wages must not tend to impair or depress the wage rates or working standards established for experienced workers for work of a like or comparable nature.

(6) The issuance of such a certificate must not tend to prevent the development of apprenticeships or must not impair established apprenticeship standards in the occupation or industry involved.

[§ 5, Regulation 294.6.004, filed 3/23/60.]

WAC 296-128-200 Terms and conditions of special student learner certificate. (1) The special student learner certificate if issued shall specify among other things:

(a) The name of the student learner; (b) the name and address of the employer; (c) the name of the school which provides the related school instruction; (d) the occupation in which the student is to be trained; (e) the maximum number of hours of employment training in any one week at a specified subminimum wage rate; (f) the number of hours per week in which the student is engaged in his school training program; (g) the effective and expiration dates of the certificate.

(2) The subminimum wage rate shall be not less than 75 percent of the minimum wage provided in RCW 49.46.020.

(3) Unless otherwise authorized by the director or his authorized representative the number of hours of employment training each week at subminimum wages pursuant to certificate, when added to the hours of school instruction

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shall not exceed 40 hours: *Provided, however,* That when school is not in session on any school day or school week, the student learner may work a number of hours in addition to the weekly number of hours of employment training authorized by the certificate, provided that the hours do not exceed 8 in such day or 40 in such week.

(4) Unless otherwise authorized by the director or his authorized representative the total number of hours worked by all student learners employed by an employer shall not exceed 10 percent of the total hours worked by all regular employees of said employer in the establishment in which such student learners are employed.

[§ 6, Regulation 294.6.004, filed 3/23/60.]

WAC 296-128-205 Term of special certificate. A special student learner certificate may be issued for a period not to exceed the length of one school year unless the director finds that a longer period is justified by extraordinary circumstances.

[§ 7, Regulation 294.6.004, filed 3/23/60.]

WAC 296-128-210 Review. Any person aggrieved by the action of the director or his authorized representative in denying or granting a special student learner certificate may within 15 days after the mailing of notice of such action file a written request for review which will be granted where such request sets forth reasonable grounds therefor. To the extent the director or his authorized representative deems it necessary he shall afford all persons interested in said review an opportunity to be heard.

[§ 8, Regulation 294.6.004, filed 3/23/60.]

WAC 296-128-215 Amendment of this regulation. Any person desiring revision of any of the terms of this regulation may submit in writing to the director a petition setting forth the changes desired and the reasons for proposing them. If the director believes that reasonable cause for amendment of this regulation is set forth he will schedule a hearing in accordance with RCW 49.46.080.

[§ 9, Regulation 294.6.004, filed 3/23/60.]

APPRENTICES

WAC 296-128-225 Employment of apprentices at subminimum wages. The director or his authorized representative, to the extent necessary to prevent curtailment of employment opportunities, shall issue special certificates to employers or apprenticeship committees as defined in RCW 49.04.040 authorizing the employment of apprentices in skilled trades at wages lower than the minimum wage applicable under RCW 49.46.020, subject to the limitations and conditions set forth in this regulation.

[§ 1, Regulation 294.6.002, filed 12/30/60.]

WAC 296-128-230 Definition of apprentice. The term "apprentice" shall mean a person at least 16 years of age who is covered by a written agreement registered with the Washington state apprenticeship council providing for not less than 4,000 hours of reasonably continuous employment for such person, and for his participation in an approved schedule of

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work experience through employment which should be supplemented by 144 hours per year of related technical instruction.

[§ 2, Regulation 294.6.002, filed 12/30/60.]

WAC 296-128-235 Registration of apprenticeship agreement. Before an apprentice may be employed at subminimum wages, the employer or apprenticeship committee shall have submitted an apprenticeship agreement for registration with the director of apprenticeship or the apprenticeship council of the department of labor and industries.

[§ 3, Regulation 294.6.002, filed 12/30/60.]

WAC 296-128-240 Procedure for issuing certificates authorizing employment of apprentices at subminimum wages. (1) Upon being informed by the director of apprenticeship that such apprenticeship agreement has been accepted for registration in accordance with RCW 49.04.030, and that such agreement calls for employment of apprentices at subminimum wages, the director, or his authorized representative, may issue a special certificate in accordance with WAC 296-128-225. Otherwise, he shall deny the special certificate.

(2) The special certificate, if issued, shall be mailed to the employer or apprenticeship committee and a copy shall be mailed to the apprentice. If the certificate is denied, the employer or apprenticeship committee will be so notified by mail.

(3) A special certificate will not be issued where there are serious outstanding violations involving an employer for whom a special certificate is being requested, or where there are any serious outstanding violations of a certificate previously issued, or where there have been any serious violations of the act which provide reasonable grounds to conclude that the terms of a certificate may not be complied with, if issued.

[§ 4, Regulation 294.6.002, filed 12/30/60.]

WAC 296-128-245 Terms of special certificate. (1) Each special certificate shall specify the conditions and limitations under which it is granted, including the name of the apprentice, the skilled trade in which he is to be employed, the subminimum wage rates and the periods of time during which such wage rates may be paid.

(2) The terms of any special certificate, including the wages specified therein may be amended for cause.

[§ 5, Regulation 294.6.002, filed 12/30/60.]

WAC 296-128-250 Hearing procedure. The director or his authorized representative may conduct an investigation, which may include a hearing, prior to issuing or denying an application for special certificate. To the extent he deems appropriate, the director, or his authorized representative, may provide an opportunity for other interested persons to be heard prior to granting or denying an apprentice certificate.

[§ 6, Regulation 294.6.002, filed 12/30/60.]

EMPLOYMENT OF STUDENT WORKERS

WAC 296-128-275 Applicability. The regulations hereinafter set forth are issued pursuant to RCW 49.46.060 to pro-

vide for the employment by educational institutions under special certificates of student workers as learners at wages lower than the minimum wage applicable under RCW 49.46.020. Such certificates shall be subject to the terms and conditions hereinafter set forth.

[§ 1, Regulation 294.6.001, filed 3/23/60.]

WAC 296-128-280 Definitions. As used in the regulations:

(1) A "student worker" is a student who is receiving instruction in a bona fide educational program in an educational institution and who is employed on a part-time basis by the educational institution from which the student is receiving his instruction, for the purpose of enabling the student to defray part of his school expenses.

(2) "Department" means department of labor and industries.

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

(4) "Supervisor" means supervisor of wage and hour division of the department of labor and industries.

[§ 2, Regulation 294.6.001, filed 3/23/60.]

WAC 296-128-285 Filing applications. Whenever the employment of student workers as learners at wages lower than the minimum wage applicable under RCW 49.46.020 is believed necessary to prevent curtailment of opportunities for employment in a specified educational institution, applications for special certificates authorizing the employment of such student workers as learners at subminimum wage rates may be filed by an appropriate official of the educational institution with the director, supervisor, or duly authorized representative of the wage and hour division of the department of labor and industries on official forms furnished by the department.

[§ 3, Regulation 294.6.001, filed 3/23/60.]

WAC 296-128-290 Issuing or denying certificates. Upon receipt of an application for the employment of student workers as learners, the director or his authorized representative shall issue or deny a special certificate authorizing employment of student workers. To the extent he deems appropriate, the director or his authorized representative may provide an opportunity to other interested persons to present data and views on the application prior to granting or denying a student worker certificate. If a student worker certificate is granted, it shall be mailed to the educational institution. If a student worker certificate is denied, notice of such denial shall be mailed to the educational institution and such denial shall be without prejudice to the filing of any subsequent application.

[§ 4, Regulation 294.6.001, filed 3/23/60.]

WAC 296-128-295 Conditions governing issuance of certificates. The following conditions shall govern the issuance of a special certificate authorizing the employment of student workers as learners by an educational institution at subminimum wage rates:

(1) The employment of the student workers at subminimum wages authorized by the certificate must be necessary

to prevent curtailment of opportunities for employment in a specified educational institution.

(2) The issuance of the student worker certificate will not tend to create unfair competitive labor cost advantages nor have the effect of impairing or depressing wage or working standards established for experienced workers for work of a like or comparable character in the industry or community.

(3) The occupations to be filled by the student workers shall not be in the production of goods or services which would be sold in competition with privately owned businesses, nor in enterprises operated by the educational institution in competition with privately owned businesses.

(4) There have been no serious outstanding violations of the provisions of a student workers certificate previously issued to the educational institution, nor have there been any serious violations of the act which provide reasonable grounds to conclude that the terms of a student worker certificate may not be complied with, if issued.

[§ 5, Regulation 294.6.001, filed 3/23/60.]

WAC 296-128-300 Data required on certificate. The student worker certificate, if issued, shall specify, among other things:

(1) The name and address of the educational institution employing the student workers;

(2) The occupations in which the student workers are employed;

(3) The number of student workers to be employed in any one day;

(4) The authorized subminimum wage rate to be paid for each occupation;

(5) The effective and expiration dates of the certificate.

[§ 6, Regulation 294.6.001, filed 3/23/60.]

WAC 296-128-305 Wage rate. The subminimum wage rate shall be not less than 75 percent of the minimum wage rate established by RCW 49.46.020, as it may be amended.

[§ 7, Regulation 294.6.001, filed 3/23/60.]

WAC 296-128-310 Records. In addition to any other records required by reason of the Washington Minimum Wage and Hour Act, the educational institution shall keep and maintain the following records specifically relating to student workers employed at subminimum wage rates:

(1) Each student worker employed under a student worker certificate shall be designated as such on the payroll records kept by the institution, with each student worker's occupation and rate of pay being shown.

(2) The records required including a copy of any special certificate issued, shall be kept and made available for inspection at all times for at least three years from the effective date of the certificate.

[§ 8, Regulation 294.6.001, filed 3/23/60.]

WAC 296-128-315 Amending and revoking certificates. The director of the department of labor and industries or his authorized representative may amend the provisions of a student worker certificate or he may revoke such certificate where it is shown to his satisfaction that its provisions have not been complied with.

[§ 9, Regulation 294.6.001, filed 3/23/60.]

WAC 296-128-400 Minors. (1) Applicability of order.

This order shall apply to all minors employed in any industry or establishment in the state of Washington who are not expressly covered by another minimum wage and welfare order issued by the industrial welfare committee, except: Minors employed:

(a) By common carrier railroads, sleeping car companies and freight or express companies subject to regulations of federal law.

(b) In agricultural labor.

(c) In domestic work or chores performed in or about private residences.

(d) In a vocational education, work experience or apprentice training program, when such program is properly supervised by school personnel or in accordance with written agreements and approved training schedules.

(e) Directly by a telephone or telegraph company. This order shall not apply to newspaper vendors and newspaper carriers.

(2) Definitions. For the purpose of this order:

(a) A "minor" is a person of either sex under the age of eighteen years.

(b) The term "employee" shall mean any minor who is employed to work in any industry or establishment in the state of Washington other than those expressly excluded by the foregoing paragraphs.

(c) The term "employer" shall mean any person, association, corporation, co-partnership, or municipal corporation, engaged in any industry or establishment covered by this order and who (or which) employs any minor covered by this order.

(d) The term "agricultural labor" shall mean employment.

(i) On a farm, in the employ of any person in connection with the cultivating of the soil, or in connection with raising or harvesting any agricultural or horticultural commodity, including raising, shearing, feeding, caring for, training and management of livestock, bees, poultry, and furbearing animals and wildlife, or in the employ of the owner or tenant or other operator of a farm in connection with the operation, management, conservation, improvement, or maintenance of such farm and its tools and equipment; or

(ii) In handling, planting, packing, packaging, grading, storing, or delivering to storage or to a market or to a carrier for transportation to market, any agricultural or horticultural commodity; but only if such service is performed as an incident to ordinary farming operations, or, in the case of fruits and vegetables in their raw and natural state, as an incident to the preparation of such fruits and vegetables for market. The provisions of this paragraph shall not be deemed to be applicable with respect to services performed in connection with commercial canning or commercial freezing or any other commercial processing which changes the character of the product from its raw and natural state or in connection with any agricultural or horticultural commodity after its delivery to a terminal market for distribution for consumption.

(3) **Minimum wages.**

(a) Minimum wages for all minors covered by this order, in the state of Washington shall be fifty cents per hour, regardless of the manner in which they are computed, except when another order (or orders) issued by the industrial welfare committee of the state of Washington provides a different minimum.

(b) Whenever the administrator of the wage and hour division of the United States department of labor shall issue a certificate or certificates permitting the employment of learners, apprentices, messengers, and handicapped workers, at wage rates below the minimums herein fixed, the payment of wages in accordance with such permits shall not constitute a violation of this order.

(4) **Hours.**

(a) No minor shall be employed more than five hours without a meal period, on the employee's time, of at least thirty minutes.

(b) There shall be a rest period on the employer's time of ten minutes in every four-hour period of employment.

(c) Minors 14 and 15 years of age shall not be employed more than eight hours in any one day or six days in any one week. In computing the hours, one-half the total attendance hours in school shall be included. When school is not in session said minors shall not be employed more than forty hours in any one week.

(d) Minors 16 and 17 years of age shall not be employed more than eight hours in any one day or six days in any one week except in seasonal industries or in cases of emergency.

(e) Minors 14 and 15 years of age shall not be permitted to work after the hours of 7:00 p.m. or before 6 a.m. (pacific standard time), unless such employment is specifically authorized by the terms of this order, or by a permit specifically authorizing such employment issued by the industrial welfare committee of the state department of labor and industries, or its duly designated agent for the issuance of such permit.

(f) Minor boys 14 and 15 years of age may be issued permits to work in approved amusement industries not more than six days a week and not later than 7:00 p.m. (pacific standard time).

(g) Minors 16 and 17 years of age attending school may be employed after 7:00 p.m. (pacific standard time) for such hours not exceeding eight hours in any one day, and in such employments, as shall be specifically authorized in the individual permits issued to each minor, when upon investigation by the supervisor of women and minors in industry the conditions of employment are found not detrimental to the welfare of the minors or their school program. Such permits shall not be issued to girls unless satisfactory assurance is given the industrial welfare committee of the state department of labor and industries or its authorized agent that such minors are to be safely conveyed to their homes.

(5) **Work permits and proof of age certificates.**

(a) No minor shall be employed in any occupation covered by this order unless the employer has on file during the period of employment an unexpired work certificate or permit issued by the industrial welfare committee of the state department of labor and industries or its duly designated agent for the issuance of such permit. Such permit will not be issued except upon presentation of such evidence of age as is required by the industrial welfare committee.

(b) The issuance of a certificate or permit to work shall not authorize or excuse a violation of the state of Washington compulsory school attendance law, and shall not be issued to any minor legally required to attend school when school is in session except with the approval of the school authorities.

(6) Employment prohibited to all minors.

(a) No minor shall be employed in any occupation which the state department of labor and industries, through its industrial welfare committee, shall upon due notice and hearing find and by order declare to be particularly hazardous for the employment of minors under the ages specified in such order as detrimental to their health or morals.

(b) No minor shall be permitted to work in any of the following occupations:

(i) In any place where intoxicating liquor is served in the same room.

(ii) As driver or helper on state licensed motor vehicles in traffic congested areas.

(iii) In operating, tending or in dangerous proximity to dangerous power driven machinery.

(iv) In connection with the commercial operation of a 35 millimeter projection machine in a motion picture theatre or public building.

(v) To give signals to engineers in logging operations, or to receive and forward signals.

(vi) As an engineer, or within dangerous proximity to any cables, rigging or hazardous machinery.

(7) Employment prohibited to all minor girls. No minor girl shall be employed as:

(a) A shaker in a laundry, except on hand towels, handkerchiefs, napkins and similar small articles.

(b) In or in connection with a barber shop.

(c) A canvasser or peddler from house to house.

(d) An elevator operator.

(e) A clerk selling cigars or tobacco.

(f) A hotel messenger.

(g) A cabaret performer.

(h) In shooting galleries, penny arcades, bowling alleys.

(i) A public messenger (i.e., one whose services are available to the public for hire), except that girls 16 and 17 years of age will be permitted as building messengers in buildings within a radius of three blocks from one another.

(8) Employment entirely prohibited to minors under 16 years of age. Minors under sixteen years of age shall not be permitted to operate machinery in connection with processing or manufacturing plants.

(9) Employments prohibited to minors under 14 years of age. Minors under fourteen years of age shall not be employed in the following occupations unless such employment is specifically authorized by a permit issued by a judge of the superior court of the state of Washington:

(a) In stock room work in warehouses.

(b) As clerks in mercantile establishments.

(c) In offices as errand or office maintenance workers.

(d) In cafes as bus boys or dishwashers or helpers.

(e) As service station attendants.

(f) In other occupations which the industrial welfare committee, after due notice and hearing, shall have determined to be hazardous or detrimental to the welfare of the minor.

(10) Employment of minors 14 to 18 years of age. Minors 14 to 18 years of age may be employed in any occupation or industry except where such employment is expressly prohibited by this order or by statute of the state of Washington, provided that all the conditions and requirements of this order are complied with.

(11) Working conditions.

(a) All places where minors are employed shall be maintained in a safe and sanitary condition. The requirements for safety, sanitation and first aid shall be in conformity with the safety standards, rules and regulations as adopted by the division of safety of the department of labor and industries.

(b) Every room in which minors are employed shall be adequately heated and ventilated, and supplied with adequate natural or artificial light in accordance with the general safety standards of the department of labor and industries.

(c) Each such room shall be provided with a smooth, tight floor, which can be kept clean and sanitary. Where wet processes are employed, the floors must be adequately drained so that there will be no unreasonable depth of liquid at any point. Where floors are wet, wooden racks or grating of an adequate height shall be provided at such points.

(d) Toilet rooms shall be provided for women and female minors sufficiently separated and isolated to insure privacy, which rooms shall be maintained in a sanitary condition, adequately lighted, heated and ventilated. A sufficient number of wash bowls or sink space shall be located either within the toilet room or adjacent to the toilet room. Any wash bowls or sinks not so located shall be installed in an approved location. Sufficient soap and either individual or paper towels shall be provided.

(e) Employers shall provide for adequate keeping of employee's outer clothing during working hours, and for their work clothes during nonworking hours. When the occupation requires a change of clothing, a suitable space adequately heated shall be provided where employees may make such change in privacy.

(f)(i) A suitable rest room for women and female minors shall be provided, and shall be properly ventilated and heated.

(ii) An adequate cloak room shall be provided.

(iii) An adequate lunch room furnished with tables and chairs, and facilities for heating water shall be provided: *Provided, however,* That where less than ten women and female minors are regularly employed, the supervisor of women and minors in industry, upon application and showing, may permit a modified compliance with the foregoing part of this section or any part of the same.

(g) No female minor shall be required or permitted to lift or carry an excessive weight.

(h) No female minor shall be knowingly employed for a period of four weeks before confinement for pregnancy or four weeks thereafter.

(12) Records. Records showing the name of minors employed, dates of employment, wages paid and the hours worked by them, shall be kept by the employer and available for inspection by the representatives of the industrial welfare committee of the state department of labor and industries at all reasonable times.

(13) **Posting of order.** The employer shall post a copy of this order in all places where minor workers are employed.

(14) **Separability.** If the application of any provision of this order, or any section, subsection, subdivision, sentence, clause, phrase, word or portion of this order shall be held invalid or unconstitutional, the remaining provisions thereof shall not be affected thereby but shall continue to be given full force and effect as if the part so held invalid or unconstitutional had not been included therein.

(15) **Penalties.** The supervisor of women and minors in industry shall investigate the complaint of any individual alleging that this order has been violated. Any person employing a minor in violation of this order shall upon conviction thereof be punished in accordance with the applicable laws of the state of Washington, RCW 49.12.170, now states as follows: "Any person employing a woman or minor for whom a minimum wage or standard conditions of labor have been specified, at less than said minimum wage, or under conditions of labor prohibited by order of the committee; or violating any other of the provisions of RCW 49.12.010 through 49.12.180, shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof, be punished by a fine of not less than twenty-five dollars nor more than one hundred dollars."

[Minimum Wage and Welfare Order No. 49, filed 3/23/60.]

WAC 296-128-500 Purpose. This regulation is adopted in accordance with chapter 49.46 RCW to define the terms "bona fide executive, administrative, or professional capacity or in the capacity of outside salesman" and to establish a procedure for computing overtime pay.

[Order 76-5, § 296-128-500, filed 2/24/76.]

WAC 296-128-510 Executive. The term "individual employed in a bona fide executive . . . capacity" in RCW 49.46.010 (5)(c) shall mean any employee:

(1) Whose primary duty consists of the management of the enterprise in which he is employed or of a customarily recognized department or subdivision thereof; and

(2) Who customarily and regularly directs the work of two or more other employees therein; and

(3) Who has the authority to hire or fire other employees or whose suggestions and recommendations as to the hiring or firing and as to the advancement and promotion or any other change of status of other employees will be given particular weight; and

(4) Who customarily and regularly exercises discretionary powers; and

(5) Who does not devote more than 20 percent, or, in the case of an employee of a retail or service establishment who does not devote as much as 40 percent, of his hours worked in the work week to activities which are not directly and closely related to the performance of the work described in paragraphs (1) through (4) of this section: *Provided*, That this paragraph (5) shall not apply in the case of an employee who is in sole charge of an independent establishment or a physically separated branch establishment, or who owns at least a 20 percent interest in the enterprise in which he is employed; and

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(6) Who is compensated for his services on a salary basis at a rate of not less than \$155 per week exclusive of board, lodging, and other facilities: *Provided*, That an employee who is compensated on a salary rate of not less \$250 per week (exclusive of board, lodging, or other facilities), and whose primary duty consists of the management of the enterprise in which he is employed or of a customarily recognized department or subdivision thereof, and includes the customary and regular direction of the work of two or more other employees therein, shall be deemed to meet all of the requirements of this section.

[Order 76-5, § 296-128-510, filed 2/24/76.]

WAC 296-128-520 Administrative. The term "individual employed in a bona fide . . . administrative . . . capacity" in RCW 49.46.010 (5)(c) shall mean any employee:

(1) Whose primary duty consists of the performance of office or non-manual field work directly related to management policies or general business operations of his employer or his employer's customers; or

(2) The performance of functions in the administration of a school system, or educational establishment or institution, or of a department or subdivision thereof, in work directly related to the academic instruction or training carried on therein; and

(3) Who customarily and regularly exercises discretion and independent judgment; and

(a) Who regularly and directly assists a proprietor, or an employee employed in a bona fide executive or administrative capacity (as such terms are defined in this regulation), or

(b) Who performs under only general supervision work along specialized or technical lines requiring special training, experience or knowledge, or

(c) Who executes under only general supervision special assignments and tasks; and

(4) Who does not devote more than 20 percent, or, in the case of an employee of a retail or service establishment who does not devote as much as 40 percent of his hours worked in the work week to activities which are not directly and closely related to the performance of the work described in paragraphs (1) through (3) of this section; and

(a) Who is compensated for his services on a salary or fee basis at a rate of not less than \$155 per week exclusive of board, lodging, or other facilities; or

(b) Who, in the case of academic administrative personnel is compensated for his services as required by paragraph (4)(a) of this section, or on a salary basis which is at least equal to the entrance salary for teachers in the school system, educational establishment, or institution by which he is employed: *Provided*, That an employee who is compensated on a salary or fee basis at a rate of not less than \$250 per week (exclusive of board, lodging, or other facilities), and whose primary duty consists of the performance of office or non-manual work directly related to management policies or general business operations of his employer or his employer's customers; which includes work requiring the exercise of discretion and independent judgment, shall be deemed to meet all of the requirements of this section.

[Order 76-5, § 296-128-520, filed 2/24/76.]

WAC 296-128-530 Professional. The term "individual employed in a bona fide . . . professional capacity" in RCW 49.46.010 (5)(c) shall mean any employee:

(1) Whose primary duty consists of the performance of work:

(a) Requiring knowledge of an advanced type in a field of science or learning customarily acquired by a prolonged course of specialized intellectual instruction and study, as distinguished from a general academic education and from an apprenticeship, and from training in the performance of routine mental, manual, or physical processes, or

(b) Original and creative in character in a recognized field of artistic endeavor (as opposed to work which can be produced by a person endowed with general manual or intellectual ability and training), and the result of which depends primarily on the intention, imagination, or talent of the employee; or

(c) Teaching, tutoring, instructing, or lecturing in the activity of imparting knowledge and who is employed and engaged in this activity as a teacher in the school system or educational establishment or institution by which he is employed; and

(2) Whose work requires the consistent exercise of discretion and judgment in its performance; and

(3) Whose work is predominantly intellectual and varied in character (as opposed to routine mental, manual, mechanical or physical work) and is of such a character that the output produced or the result accomplished cannot be standardized in relation to a given period of time; and

(4) Who does not devote more than 20 percent of his hours worked in the work week to activities which are not an essential part of and necessarily incident to the work described in paragraphs (1) through (3) of this section; and

(5) Who is compensated for his services on a salary or fee basis at a rate of not less than \$170 per week exclusive of board, lodging, or facilities: *Provided*, That this paragraph (5) shall not apply in the case of an employee who is the holder of a valid license or certificate permitting the practice of law, medicine, or dentistry and who is actually engaged in the practice thereof: *Provided*, That an employee who is compensated on a salary or fee basis at a rate of not less than \$250 per week (exclusive of board, lodging, or other facilities), and whose primary duty consists of the performance of work either requiring knowledge of an advanced type in a field of science or learning, which includes work requiring the consistent exercise of discretion and judgment, or requiring invention, imagination, or talent in a recognized field of artistic endeavor, shall be deemed to meet all of the requirements of this section.

[Order 76-5, § 296-128-530, filed 2/24/76.]

WAC 296-128-535 Are professional computer employees exempt from the Washington Minimum Wage Act? (1) Any employee who is a computer system analyst, computer programmer, software engineer, software developer or other similarly skilled worker will be considered a "professional employee" and will be exempt from the minimum wage and overtime provisions of the Washington Minimum Wage Act if:

(a) Their primary duty is of one of the following:

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(i) Applying systems analysis techniques and procedures to determine hardware, software, or system functional specifications for any user of such services; or

(ii) Following user or system design specifications to design, develop, document, analyze, create, test or modify any computer system, application or program, including prototypes; or

(iii) Designing, documenting, testing, creating or modifying computer systems, applications or programs for machine operation systems; or

(iv) Any combination of the above primary duties whose performance requires the same skill level; and

(b) Their rate of pay is at least \$27.63 per hour.

(2) **This professional exemption only applies to** highly skilled employees who:

(a) Possess a high degree of theoretical knowledge and understanding of computer system analysis, programming and software engineering; and

(b) Have the ability to practically apply that theoretical knowledge and understanding to highly specialized computer fields; and

(c) Generally attain the necessary level of expertise and skill to qualify for an exemption through a combination of education and experience in the field; and

(d) Consistently exercise discretion and judgment in the application of their special knowledge as opposed to performing purely mechanical or routine tasks; and

(e) Engage in work that is predominantly intellectual and inherently varied in character as opposed to work that is routinely mental, manual, mechanical, or physical.

(3) While many employees who qualify for this exemption hold a bachelor's or higher degree, **no degree is required for this exemption.**

(4) This professional exemption **does not apply to:**

(a) Trainees or employees in entry level positions learning to become proficient in computer systems analysis, programming and software engineering; or

(b) Employees in computer systems analysis, programming and software engineering positions who have not attained a level of skill and expertise which allows them to generally work independently and without close supervision; or

(c) Employees engaged in the operation of computers; or

(d) Employees engaged in the manufacture, repair or maintenance of computer hardware and related equipment; or

(e) Employees covered by a collective bargaining agreement.

[Statutory Authority: RCW 49.46.010 (5)(c), 98-02-027, § 296-128-535, filed 12/31/97, effective 2/1/98.]

WAC 296-128-540 Outside salesman. The term "individual employed in the capacity of outside salesman" in RCW 49.46.010 (5)(c) shall mean any employee:

(1) Who is employed for the purpose of and who is customarily and regularly engaged away from his employer's place or places of business, as well as on the premises (where the employee regulates his own hours and the employer has no control over the total number of hours worked) in the following alternative activities:

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(a) In making sales; including any sale, exchange, contract to sell, consignment for sale, shipment for sale or other disposition; or

(b) In obtaining orders or contracts for services or for the use of facilities for which a consideration will be paid by the client or customer; or

(c) In demonstrating products or equipment for sale; or

(d) In the sale of services and performance of the service sold when the compensation to the employee is computed on a commission basis; and

(2) Whose hours of work of a nature other than that described in (1)(a), (b), (c) and (d) of this section do not exceed 20 percent of the hours worked in the work week by nonexempt employees of the employer: *Provided*, That work performed incidental to and in conjunction with the employee's own outside sales or solicitations, including incidental deliveries and collections, shall not be regarded as nonexempt work; and

(3) Who is compensated by the employer on a guaranteed salary, commission or fee basis and who is advised of his status as "outside salesman."

[Order 76-5, § 296-128-540, filed 2/24/76.]

WAC 296-128-550 Regular rate of pay. The regular rate of pay shall be the hourly rate at which the employee is being paid, but may not be less than the established minimum wage rate. Employees who are compensated on a salary, commission, piece rate or percentage basis, rather than an hourly wage rate, unless specifically exempt, are entitled to one and one-half times the regular rate of pay for all hours worked in excess of 40 per week. The overtime may be paid at one and one-half times the piecework rate during the overtime period, or the regular rate of pay may be determined by dividing the amount of compensation received per week by the total number of hours worked during that week. The employee is entitled to one and one-half times the regular rate arrived at for all hours worked in excess of 40 per week.

[Order 76-5, § 296-128-550, filed 2/24/76.]

WAC 296-128-560 Compensating time off in lieu of overtime pay. The provisions of chapter 49.46 RCW requiring one and one-half times the regular rate of pay for hours worked in excess of 40 per week does not apply to any person who requests compensating time off in lieu of overtime pay. Therefore, compensating time may be as agreed upon by the employer and the individual employee at the request of the employee, but may not be imposed by the employer in lieu of overtime pay upon any employee who has not so requested such compensating time off.

[Order 76-5, § 296-128-560, filed 2/24/76.]

**Chapter 296-130 WAC
FAMILY CARE**

WAC

296-130-010	Declaration of purpose.
296-130-020	Definitions.
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296-130-035	Employee complaints.
296-130-040	Prohibited action.
296-130-050	Posting.
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296-130-065	Service on employers.
296-130-070	Appeal of infraction notice.
296-130-080	Penalty assessment.
296-130-500	Collective bargaining not impaired.

WAC 296-130-010 Declaration of purpose. It is in the public interest for employers to accommodate employees by providing reasonable leaves from work for family reasons. This chapter serves to establish a minimum standard allowing an employee to use the employee's accrued sick leave to care for a child of the employee.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-010, filed 8/31/88.]

WAC 296-130-020 Definitions. (1) "Employer" means any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees. Employer also includes the state, any state institution, any state agency, political subdivisions of the state, and any municipal corporation or quasi-municipal corporation.

(2) "Employee" means a worker who is employed in the business of an employer. "Employee," for the purposes of this chapter, also includes workers performing in an executive, administrative, professional, or outside sales capacity.

(3) "Employ" means to engage, suffer, or permit to work.

(4) "Accrued sick leave" means leave which the employee has accumulated by earning a certain number of hours or days per month or per year which the employee is entitled to use to continue his or her normal compensation during absences due to illness, accident, or other conditions which require medical treatment or supervision, and which is provided for by a collective bargaining agreement, employer/employee agreement, employer policy, ordinance, or civil service rule.

It does not include annual leave, vacation leave, or personal leave. It does not include any benefit which includes leave granted by short-term or long-term disability plans except in a case where those plans include a separate and identifiable component which allows the employee to accumulate by earning a certain number of hours or days per month or per year which the employee is entitled to use to continue his or her normal compensation in absence due to illness, accident, or other conditions which require medical treatment or supervision which is provided for by a collective bargaining agreement, employer/employee agreement, employee/employer policy, ordinance, or civil service rule. In a case where a short-term or long-term disability plan includes a separate and identifiable component which allows the employee to accumulate leave by earning a certain number of hours or days per month or per year which the employee is entitled to use to continue his or her normal compensation in absence due to illness, accident, or other conditions which require medical treatment or supervision, only that separate identifiable portion shall be considered accrued sick leave.

(5) "Child of the employee" means any child under the age of eighteen who is:

- (a) The natural offspring of the employee;
- (b) The adopted child of the employee;

(c) The natural or adopted child of the employee's spouse; or

(d) Is under the employee's legal guardianship, legal custody, or foster care.

(6) "Health condition that requires treatment or supervision" shall include:

(a) Any medical condition requiring medication that the child cannot self medicate;

(b) Any medical or mental health condition which would endanger the child's safety or recovery without the presence of a parent or guardian; or

(c) Any condition warranting preventive health care such as physical, dental, optical or immunization services, when a parent must be present to authorize and when sick leave may otherwise be used for the employee's preventive health care.

(7) "Infraction" means an alleged violation of RCW 49.12.____ (chapter 236, Laws of 1988) as cited by the department.

(8) "Administrative law judge" means any person appointed by the chief administrative law judge, as defined in RCW 34.12.020(2) to preside at contested cases convened under RCW 49.12.____ (chapter 236, Laws of 1988).

(9) "Department" means the department of labor and industries.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-020, filed 8/31/88.]

WAC 296-130-030 Employee rights. An employer shall allow an employee to use the employee's accrued sick leave, when such benefit exists, to care for the child of the employee under the age of eighteen with a health condition that requires treatment or supervision as defined in WAC 296-130-020(6). In all other instances the same benefits and requirements that would govern the employee's personal use of accrued sick leave shall apply to the use of sick leave for the child's treatment or supervision. Nothing in this section requires an employer to provide sick leave.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-030, filed 8/31/88.]

WAC 296-130-035 Employee complaints. (1) An employee who believes that his or her employer has not complied with RCW 49.12.____ (chapter 236, Laws of 1988), or with the rules promulgated thereto, may file a complaint with the department within six months of the alleged violation. The complaint should contain the following:

(a) The name and address of the employee making the complaint;

(b) The name, address, and telephone number of the employer against whom the complaint is made;

(c) A statement of the specific fact which constitute the alleged violation, including the date(s) on which the alleged violation occurred.

(2) Upon receipt of a complaint, the department shall forward written notice of the complaint to the employer, along with a warning of prohibited actions as stated in WAC 296-130-040.

(3) The department may investigate any complaint it deems appropriate. If the department determines that a viola-

tion of this chapter has occurred, it may issue a notice of infraction pursuant to WAC 296-130-060.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-23-117 (Order 88-29), § 296-130-035, filed 11/23/88.]

WAC 296-130-040 Prohibited action. No employer shall discharge or in any other way discriminate against or penalize any employee because he/she sought any information about family leave provisions, has filed a complaint alleging a violation of the chapter or exercised any right granted under the law. Nothing in this section however, shall prohibit an employer from applying its attendance policies.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-040, filed 8/31/88.]

WAC 296-130-050 Posting. (1) The department shall furnish each employer a poster describing an employee's rights and an employer's obligations provided in this chapter.

(2) The employer shall keep posted a current edition department poster stipulating the provisions of this chapter. The employer shall display this poster in a conspicuous place.

(3) The employer shall post its leave policies, if any, in a conspicuous place accessible to the employees at the employer's place of business.

(4) The posting requirement for employees whose leave policies are specified by individual contracts may be satisfied by stating that leave for such employees will be governed by the terms of such contracts.

(5) Employers with informal leave policies which are established on a case-by-case basis may satisfy the posting requirement by posting a statement explaining that policy.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-050, filed 8/31/88.]

WAC 296-130-060 Notices of infraction. The department may issue a notice of infraction to an employer who violates RCW 49.12.____ (chapter 236, Laws of 1988). The employment standards supervisor shall direct that notices of infraction contain the following when issued.

(1) A statement that the notice represents a determination that the infraction has been committed by the employer named in the notice and that the determination shall be final unless contested;

(2) A statement that the infraction is a noncriminal offense for which imprisonment shall not be imposed as a sanction;

(3) A statement of the specific violation which necessitated issuance of the infraction;

(4) A statement of the penalty involved if the infraction is established;

(5) A statement informing the employer of the right to a hearing conducted pursuant to chapter 34.04 RCW if requested within twenty days of issuance of the infraction;

(6) A statement that at any hearing to contest the notice of infraction the state has the burden of proving, by a preponderance of the evidence, that the infraction was committed, and that the employer may subpoena witnesses including the agent that issued the notice of infraction;

(7) If a notice of infraction is personally served upon a supervisory or managerial employee of a firm or corporation,

the department shall within ten days of service send a copy of the notice by certified mail to the employer;

(8) Constructive service may be made by certified mail directed to the employer named in the notice of infraction.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-060, filed 8/31/88.]

WAC 296-130-065 Service on employers. (1) If an employer is a corporation or a partnership, the department need not serve the employer personally. In such a case, if no officer or partner of a violating employer is present, the department may issue a notice of infraction to any supervisor or managerial employee.

(2) If the department serves a notice of infraction on a supervisory or managerial employee, and not on an officer, or partner of the employer, the department shall mail by certified mail a copy of the notice of infraction to the employer. The department shall mail a second copy by ordinary mail.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-065, filed 8/31/88.]

WAC 296-130-070 Appeal of infraction notice. (1) If an employer desires to contest the notice of infraction issued, the employer shall file two copies of a notice of appeal with the department at the office designated on the notice of infraction, within twenty days of issuance of the infraction.

(2) The department shall conduct a hearing in accordance with chapter 34.04 RCW and chapter 10-08 WAC.

(3) Employers may appear before the administrative law judge through counsel, or may represent themselves. The department shall be represented by the attorney general.

(4) All relevant evidence shall be admissible in a hearing convened pursuant to RCW 49.12.____ (chapter 236, Laws of 1988). Admission of evidence is subject to RCW 34.04.100 and 34.04.105 of the Administrative Procedure Act of Washington.

(5) The administrative law judge shall issue a proposed decision that includes findings of fact, conclusions of law, and if appropriate, any legal penalty. The proposed decision shall be served by certified mail or personally on the employer and the department. The employer or department may appeal to the director within thirty days after the date of issuance of the proposed decision. If none of the parties appeals within thirty days, the proposed decision may not be appealed either to the director or the courts.

(6) An appellant must file with the director an original and four copies of its notice of appeal. The notice of appeal must specify which findings and conclusions are erroneous. The appellant must attach to the notice the written arguments supporting its appeal.

The appellant must serve a copy of the notice of appeal and the arguments on the other parties. The respondent parties must file with the director their written arguments within thirty days after the date the notice of appeal and the arguments were served upon them.

(7) The director shall review the proposed decision in accordance with the Administrative Procedure Act, chapter 34.04 RCW. The director may: Allow the parties to present oral arguments as well as the written arguments; require the parties to specify the portions of the record on which the par-

ties rely; require the parties to submit additional information by affidavit or certificate; remand the matter to the administrative law judge for further proceedings; and require a departmental employee to prepare a summary of the record for the director to review. The director shall issue a final decision that can affirm, modify, or reverse the proposed decision.

(8) The director shall serve the final decision on all parties. Any aggrieved party may appeal the final decision to superior court pursuant to RCW 34.04.130 unless the final decision affirms an unappealed proposed decision. If no party appeals within the period set by RCW 34.04.130, the director's decision is conclusive and binding on all parties.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-070, filed 8/31/88.]

WAC 296-130-080 Penalty assessment. An employer found to have committed an infraction under RCW 49.12.____ (chapter 236, Laws of 1988) may be assessed the maximum penalty of a fine of two hundred dollars for the first noncompliance violation. An employer that continues to violate the terms of the statute may be subject to a fine not to exceed one thousand dollars for each violation.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-080, filed 8/31/88.]

WAC 296-130-500 Collective bargaining not impaired. Nothing in this chapter shall be deemed to interfere with, impede, or in any way diminish the right of employees to bargain collectively with their employers through representatives of their own choosing in order to establish leave benefits in excess of the applicable minimum under the provisions of this chapter.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-500, filed 8/31/88.]

Chapter 296-131 WAC

AGRICULTURAL EMPLOYMENT STANDARDS

WAC

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WAC 296-131-001 Applicability. These standards, adopted pursuant to sections 83 through 86, chapter 380, Laws of 1989, shall apply to persons employed in agricultural labor as defined in RCW 50.04.150 and WAC 296-131-005. The standards in this chapter beginning at WAC 296-131-100 shall apply only to minors employed in agricultural labor.

The standards in this chapter do not apply to the immediate family members of the officers of any business engaged in agricultural production of crops or livestock.

[Statutory Authority: RCW 49.30.030, 90-14-038, § 296-131-001, filed 6/29/90, effective 11/1/90. Statutory Authority: RCW 43.22.270, 1989 c 380 and chapter 49.46 RCW, 89-22-015 (Order 89-15), § 296-131-001, filed 10/24/89, effective 11/24/89.]

WAC 296-131-005 Definitions. For the purpose of these rules:

(1) A "minor" is a person of either gender, employed in agricultural labor, who is under the age of eighteen years.

(2) "Agricultural labor" is defined as services performed:

(a) On a farm, in the employ of any person, in connection with the cultivation of the soil, or in connection with raising or harvesting any agricultural or horticultural commodity, including raising, shearing, feeding, caring for, training, and management of livestock, bees, poultry, and furbearing animals and wildlife, or in the employ of the owner or tenant or other operator of a farm in connection with the operation, management, conservation, improvement, or maintenance of such farm and its tools and equipment; or

(b) In packing, packaging, grading, storing, or delivering to storage, or to market or to a carrier for transportation to market, any agricultural or horticultural commodity; but only if such service is performed as incident to ordinary farming operations.

"Agricultural labor" does not include employment in commercial packing houses, commercial storage establishments, commercial canning, commercial freezing, or any other commercial processing with respect to services performed in connection with the cultivation, raising, harvesting and processing of oysters or raising and harvesting of mushrooms or in connection with any agricultural or horticultural commodity after its delivery to a terminal market for distribution for consumption.

(3) "Department" means the department of labor and industries.

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

(5) "Employ" means to engage, suffer, or permit to work in agricultural labor.

(6) "Employee" means any person employed by an employer, except those who are members of the immediate family of an employer.

(7) "Employer" means any person, firm, corporation, partnership, business trust, legal representative, or other business entity that engages in any agricultural activity in this state and employs one or more employees.

[Statutory Authority: RCW 49.30.030, 90-14-038, § 296-131-005, filed 6/29/90, effective 11/1/90.]

WAC 296-131-006 Authority to enter, inspect, and investigate places of employment and records, and to conduct interviews. In order to carry out the purposes of this chapter, the director or the director's authorized representative is authorized:

(1) To enter without delay any work site or area or other environment where work is performed by an employee or where employment records are, or are required to be, maintained; and

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(2) To inspect, transcribe, and copy all pertinent records, and to inspect and investigate any such place of employment and all pertinent conditions, structures, machines, apparatus, devices, equipment, and materials therein, and to question privately any employer, owner, operator, agent, or employee.

[Statutory Authority: RCW 49.30.030 and 43.22.310, 92-15-099, § 296-131-006, filed 7/20/92, effective 8/20/92.]

WAC 296-131-010 Payment interval. All wages due shall be paid at no longer than monthly intervals to each employee on established regular pay days, unless federal law requires more frequent pay intervals. To facilitate bookkeeping, an employer may implement a regular payroll system in which wages from up to seven days before pay day may be withheld from the pay period covered and included in the next pay period.

[Statutory Authority: RCW 43.22.270, 1989 c 380 and chapter 49.46 RCW, 89-22-015 (Order 89-15), § 296-131-010, filed 10/24/89, effective 11/24/89.]

WAC 296-131-015 Pay statements. A pay statement shall be provided to each employee at the time wages are paid. The pay statement shall identify the employee, show the number of hours worked or the number of days worked based on an eight-hour day, the rate or rates of pay, the number of piece work units earned if paid on a piece work basis, the gross pay, the pay period, all deductions and the purpose of each deduction for the respective pay period. A pay statement shall also include the employer's name, address, and telephone number.

[Statutory Authority: RCW 43.22.270, 1989 c 380 and chapter 49.46 RCW, 89-22-015 (Order 89-15), § 296-131-015, filed 10/24/89, effective 11/24/89.]

WAC 296-131-017 Employment records. (1) Every employer shall keep for at least three years a record of the name, address, and occupation of each employee, dates of employment, rate or rates of pay, amount paid each pay period to each such employee and the hours worked.

(2) Every employer shall make the records described in subsection (1) of this section available to the director or the director's authorized representative at any time for inspection and transcription or copying and to the employee, upon request for that employee's work record, at any reasonable time.

[Statutory Authority: RCW 43.22.270, 1989 c 380 and chapter 49.46 RCW, 89-22-015 (Order 89-15), § 296-131-017, filed 10/24/89, effective 11/24/89.]

WAC 296-131-020 Meals and rest periods. (1) Every employee employed more than five hours shall receive a meal period of at least thirty minutes. Employees working eleven or more hours in a day shall be allowed at least one additional thirty-minute meal period.

(2) Every employee shall be allowed a rest period of at least ten minutes, on the employer's time, in each four-hour period of employment. For purposes of computing the minimum wage on a piecework basis, the time allotted an employee for rest periods shall be included in the number of hours for which the minimum wage must be paid.

(1999 Ed.)

[Statutory Authority: RCW 49.30.030. 90-14-037, § 296-131-020, filed 6/29/90, effective 8/1/90.]

WAC 296-131-100 Permits to employ minors. (1) Within three days after the commencement of employment of one or more minors, an employer shall file with the department an application for a permit to employ minors. When validated by the supervisor of employment standards, this permit will authorize the employer to employ for one year any number of minor workers at the workplace specified in accordance with the conditions of the permit and the regulations established in this chapter.

(2) An employer shall at all times employ minors in accordance with the regulations established in this chapter, regardless whether the employer has filed with the department an application for a permit to employ minors as required in subsection (1) of this section.

(3) The department shall annually publicize the requirements of this chapter through departmental publications and other appropriate means designed to assist employers in complying with the law.

[Statutory Authority: RCW 49.30.030. 90-14-038, § 296-131-100, filed 6/29/90, effective 11/1/90.]

WAC 296-131-105 Parental and school authorization. (1) An employer of a minor shall be required to annually obtain written authorization from a minor's parent before employing the minor.

(2) Except when performing intermittent weekend work, a minor who is legally required to attend school and who is working during the school year shall obtain from his or her school written authorization to work a specified number of hours per day and per week up to the maximum permitted in WAC 296-131-120, based on an evaluation of the impact of work on the student's academic performance. School authorization is not required for high school graduates.

(3) The parental and school authorization required by this chapter shall be on forms supplied by the department and shall be kept on file by the employer.

(4) Neither parent nor school authorization is required for minors who are emancipated by court order.

(5) For purposes of this section, "intermittent weekend work" is defined as work during the weekend arranged to be performed after the end of the preceding school week. Work performed after the beginning of the next school day is not considered to be intermittent weekend work and requires school authorization. Work during more than two weekends per quarter is not considered to be intermittent weekend work.

[Statutory Authority: RCW 49.30.030. 90-14-038, § 296-131-105, filed 6/29/90, effective 11/1/90.]

WAC 296-131-110 Posting. (1) At least one copy of a valid permit to employ minors shall be posted in a conspicuous place at the workplace specified in the permit.

(2) An informational poster supplied by the department, describing in English and Spanish the rights of agricultural employees under this chapter, also shall be posted in a conspicuous place at the workplace specified in the permit.

[Statutory Authority: RCW 49.30.030. 90-14-038, § 296-131-110, filed 6/29/90, effective 11/1/90.]

(1999 Ed.)

WAC 296-131-115 Age of employment. No minor under the age of fourteen shall be employed in agriculture at any time except as follows: Minors twelve and thirteen years of age may be employed in the hand harvest of berries, bulbs, and cucumbers and in the hand cultivation of spinach during weeks when school is not in session.

[Statutory Authority: RCW 49.30.030. 90-14-038, § 296-131-115, filed 6/29/90, effective 11/1/90.]

WAC 296-131-120 Hours of work for minors in agriculture. (1) Minors legally required to attend school may not be employed during school hours except by special permission from school officials as provided in RCW 28A.27.010 and 28A.27.090.

(2)(a) Minors under the age of sixteen may work up to three hours a day on school days, up to eight hours a day on nonschool days and up to twenty-one hours a week during weeks when school is in session. Minors under the age of sixteen may work up to eight hours a day and up to forty hours a week during weeks when school is not in session.

(b) Except as otherwise provided, on days when school is in session, minors under the age of sixteen may not be employed before 7:00 a.m. nor after 8:00 p.m. On days when school is not in session, minors under the age of sixteen may not be employed before 5:00 a.m. nor after 9:00 p.m. On days when school is in session, minors under the age of sixteen employed in animal agriculture or whose employment in crop production requires daily attention to irrigation, may be employed beginning at 6:00 a.m.

(3)(a) Minors who are sixteen and seventeen years of age may work up to twenty-eight hours a week, up to four hours a day on school days and up to eight hours a day on nonschool days during weeks when school is in session. Minors who are sixteen and seventeen years of age may work up to ten hours per day and up to fifty hours per week during weeks when school is not in session. Minors who are sixteen and seventeen years of age may work up to sixty hours per week in the mechanical harvest of peas, wheat, and hay during weeks when school is not in session.

(b) Minors who are sixteen and seventeen years of age may not be employed before 5:00 a.m. nor after 10:00 p.m. Minors who are sixteen and seventeen years of age may not work later than 9:00 p.m. on more than two consecutive nights preceding a school day.

(4) Except for minors employed in dairy or livestock production, in the harvest of hay, or whose employment in crop production requires daily attention to irrigation, no minor shall be employed more than six days in any one week.

(5) The provisions of this section shall not apply to minors sixteen years of age and older who can demonstrate emancipation by either (a) providing a marriage certificate as proof of marriage, or (b) providing a birth certificate that names the minor as a parent. Copies of such documents must be retained by the employer for one year, pursuant to the requirements of WAC 296-131-130.

[Statutory Authority: RCW 49.30.030 and 43.22.310. 92-15-099, § 296-131-120, filed 7/20/92, effective 8/20/92. Statutory Authority: RCW 49.30.030. 90-14-038, § 296-131-120, filed 6/29/90, effective 11/1/90.]

WAC 296-131-125 Prohibited and hazardous employment. (1) Employment in the following occupations in agriculture is prohibited to minors under the age of sixteen:

(a) Operating a tractor of over 20 PTO horsepower, or connecting or disconnecting an implement or any of its parts to or from such a tractor.

(b) Operating or assisting to operate (including starting, stopping, adjusting, feeding, or any other activity involving physical contact associated with the operation) any of the following machines:

(i) Corn picker, cotton picker, grain combine, hay mower, forage harvester, hay baler, potato digger, or mobile pea viner;

(ii) Feed grinder, crop dryer, forage blower, auger conveyor, or the unloading mechanism of a nongravity-type self-unloading wagon or trailer; or

(iii) Power post-hole digger, power post driver, or non-walking type rotary tiller.

(c) Operating or assisting to operate (including starting, stopping, adjusting, feeding, or any other activity involving physical contact associated with the operation) any of the following machines:

(i) Trencher or earthmoving equipment;

(ii) Fork lift; or

(iii) Potato combine.

(d) Working on a farm in a yard, pen, or stall occupied by a:

(i) Bull, boar, or stud horse maintained for breeding purposes; or

(ii) Sow with suckling pigs, or cow with newborn calf (with umbilical cord present).

(e) Felling, bucking, skidding, loading, or unloading timber with butt diameter of more than six inches.

(f) Working from a ladder or scaffold (painting, repairing, or building structures, pruning trees, picking fruit, etc.) at a height of over twenty feet.

(g) Driving a bus, truck, or automobile when transporting passengers, or riding on a tractor as a passenger or helper.

(h) Working inside:

(i) A fruit, forage, or grain storage designed to retain an oxygen deficient or toxic atmosphere;

(ii) An upright silo within two weeks after silage has been added or when a top unloading device is in operating position;

(iii) A manure pit; or

(iv) A horizontal silo while operating a tractor for packing purposes.

(i) Working in any manufacturing occupation.

(j) Working in any processing operations, including food processing.

(k) Working in transportation, warehouse, and storage or construction.

(l) Work in or about engine or boiler rooms.

(m) Work in freezers, meat coolers, and all work in preparing meats for sale. (Wrapping, sealing, labeling, weighing, pricing, and stocking are permitted if work is performed away from meat-cutting and preparation areas.)

(2) Employment in the following occupations in agriculture is prohibited to all minors:

(a) Handling, mixing, loading or applying (including cleaning or decontaminating equipment, disposal or return of empty containers, or serving as a flagman for aircraft applying) agricultural chemicals classified under the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 135 et seq.) as Category I of toxicity, identified by the word "poison" and the "skull and crossbones" on the label; or Category II of toxicity, identified by the word "warning" on the label.

(b) Handling or using a blasting agent, including but not limited to, dynamite, black powder, sensitized ammonium nitrate, blasting caps, and primer cord.

(c) Transporting, transferring, or applying anhydrous ammonia.

(d) Work involving circular, band or chain saws, power driven wood working machines, power driven metal forming, punching and shearing machines, and guillotine shears.

(e) Work involving slaughtering, meat packing, or processing and rendering.

(f) Work involving wrecking and demolition.

(g) Work involving roofing.

(h) Work involving mechanical excavation.

(i) Work in any place where a strike or lockout exists.

(3) The employment prohibited by subsection (1) of this section shall not apply to the employment of any minor as a vocational agriculture student-learner in any of the occupations described in subsection (1)(a), (b), (c), (d), (e), or (f) of this section when each of the following requirements are met:

(a) The student-learner is enrolled in a vocational education training program in agriculture under a recognized state or local educational authority, or in a substantially similar program conducted by a private school;

(b) Such student-learner is employed under a written agreement which provides that the work of the student-learner is incidental to his training; that such work shall be intermittent, for short periods of time, and under the direct and close supervision of a qualified and experienced person; that safety instruction shall be given by the school and correlated by the employer with on-the-job training; and that a schedule of organized and progressive work processes to be performed on the job have been prepared;

(c) Such written agreement contains the name of the student-learner, and is signed by the employer and by a person authorized to represent the educational authority or school; and

(d) Copies of each such agreement are kept on file by both the educational authority or school and by the employer.

(4) The employment prohibited by subsection (1) of this section shall not apply to the employment of any minor in those occupations for which the minor has successfully completed one or more federal extension service training programs described in 29 C.F.R. section 570.72(b) and who has been instructed by the employer in the safe and proper operation of the specific equipment to be used, who is continuously and closely supervised by the employer where feasible or, where not feasible, in work such as cultivating, whose safety is checked by the employer at least at midmorning, noon, and midafternoon, or during the first and second halves of the workday, whichever is more frequent.

(5) The employment prohibited by subsection (1) of this section shall not apply to the employment of any minor in

those occupations for which the minor has successfully completed one or more of the vocational agriculture training programs described in 29 C.F.R. section 570.72(c) and who has been instructed by the employer in the safe and proper operation of the specific equipment to be used, who is continuously and closely supervised by the employer where feasible or, where not feasible, in work such as cultivating, whose safety is checked by the employer at least at midmorning, noon, and midafternoon, or during the first and second halves of the workday, whichever is more frequent.

(6) No minor shall be permitted to ride in or work in the vicinity of a vehicle driven by any person who is under the age of sixteen or anyone who does not possess a valid driver's license.

(7) No minor shall be employed in agriculture in the harvest of any crop to which agricultural chemicals described in subsection (2)(a) of this section have been applied, prior to the expiration of the preharvest interval or within fourteen days after the application if no preharvest interval has been established.

(8) If, upon inspection or investigation, the director or the director's designee believes that an employer is violating this section creating a danger from which there is a substantial probability that death or serious physical harm could result to a minor employee, the director or the director's designee may issue an order under RCW 34.05.479 immediately restraining the condition, practice, method, process, or means creating the danger and suspend the employer's permit authorizing employment of minors until action is taken to avoid, correct, or remove the danger.

(9) A copy of the federal regulations referenced in subsections (4) and (5) of this section may be obtained from the department upon request.

[Statutory Authority: RCW 49.30.030, 90-14-038, § 296-131-125, filed 6/29/90, effective 11/1/90.]

WAC 296-131-126 Lifting. Where weights in excess of twenty pounds are to be lifted, carried, pushed, or pulled as a normal part of an employee's responsibility, the employer shall instruct minors on correct weight lifting techniques prior to the commencement of work and display a poster developed by the department illustrating correct weight lifting techniques.

[Statutory Authority: RCW 49.30.030, 90-14-038, § 296-131-126, filed 6/29/90, effective 11/1/90.]

WAC 296-131-130 Recordkeeping. In addition to the records required under WAC 296-131-017, an employer is responsible for obtaining and keeping on file for one year the following information concerning each minor employee:

(1) Proof of age by means of a copy of one of the following: Birth certificate; driver's license; baptismal record; Bible record; insurance policy at least one year old indicating the date of birth; witnessed statement of the parent or guardian; or a completed federal employment eligibility verification (Form I-9);

(2) Parental authorization required by WAC 296-131-105;

(3) School authorization required by WAC 296-131-105;

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(4) Documentation of emancipation as provided by WAC 296-131-120(5).

Every employer shall make the records described in this section available to the director or the director's authorized representative at any time for inspection and transcription or copying and to the employee, upon request for that employee's work record, at any reasonable time.

[Statutory Authority: RCW 49.30.030 and 43.22.310, 92-15-099, § 296-131-130, filed 7/20/92, effective 8/20/92. Statutory Authority: RCW 49.30.030, 90-14-038, § 296-131-130, filed 6/29/90, effective 11/1/90.]

WAC 296-131-135 Revocation of permits. (1) The department may revoke any employer's permit to employ minors upon a showing that the conditions of its issuance are not being met, or that other conditions exist which are detrimental to the health, safety, or welfare of the minor.

(2) The department may refuse to issue or renew a permit to employ minors. If the department refuses to issue or renew a permit, it shall send the employer a notice of denial. The notice of denial shall explain the grounds for denial of the permit. The department may refuse to renew a permit if the conditions of its initial issuance are not being met.

(3) Any employer aggrieved by any action taken by the department under this section may appeal the action or decision by filing notice of the appeal with the director within thirty days of the department's action or decision. Upon receipt of an appeal, a hearing shall be held in accordance with chapter 34.05 RCW. The director shall issue all final orders after the hearing. Final orders are subject to appeal in accordance with chapter 34.05 RCW. Orders not appealed within the time period specified in chapter 34.05 RCW are final and binding.

[Statutory Authority: RCW 49.30.030, 90-14-038, § 296-131-135, filed 6/29/90, effective 11/1/90.]

WAC 296-131-140 Variances. (1) Upon written application from an employer or an organization representing employers, a variance permitting employment of minors otherwise prohibited under WAC 296-131-120 or 296-131-125 may be granted for good cause shown. The employer or the organization representing employers shall give written notice to the employees so that they may submit their views to the department on any variance request.

(2) The department may afford the applicant and any involved employee, or employee representatives, the opportunity for oral presentation whenever circumstances of the particular application warrant.

(3) "Good cause" shall mean, but not be limited to, those situations in which the employer demonstrates that (a) the granting of the variance would not have a harmful effect upon the health, safety, or welfare of the minor employees involved; (b) the granting of the variance would not have a deleterious effect on school attendance or the academic performance of minors; and (c) the variance is necessary to meet usual crop cultural or harvest requirements.

(4) Upon application from an employer or an organization representing employers a variance permitting employment of minors otherwise prohibited under these rules may be granted by the director or an authorized representative of the director in response to a weather emergency.

[Title 296 WAC—p. 1995]

[Statutory Authority: RCW 49.30.030, 90-14-038, § 296-131-140, filed 6/29/90, effective 11/1/90.]

Chapter 296-133 WAC

PROCEDURAL RULES SUPPLEMENTARY TO THE HEALTH CARE ACTIVITIES LABOR RELATIONS ACT, CHAPTER 156, LAWS OF 1972 EX. SESS.

WAC

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WAC 296-133-010 Intent and purpose. These rules are adopted pursuant to the authority of section 8, chapter 156, Laws of 1972 ex. sess., (hereinafter referred to as the "act") as supplementary to the act for the purpose of providing rules of procedure to aid and assist the department of labor and industries, its authorized agents, and interested parties in proceedings under the act. The department of labor and industries, (hereinafter referred to as "department") and its authorized agents may waive any requirements of these rules, unless a party shows that it would be prejudiced by such waiver or unless the rule to be waived involves a mandatory provision of the act.

[Order 72-13, § 296-133-010, filed 7/31/72.]

WAC 296-133-020 Policy. It is the policy of the department to expedite the settlement of labor disputes between health care activities and their employees and to promote peace in labor relations and nothing in these rules should be construed to prevent the department and its authorized agents, where not inconsistent with the intent and purpose of the act, from using its best efforts to adjust through conciliation any labor dispute arising between employers, employees or employee organizations subject to the provisions of the act.

[Order 72-13, § 296-133-020, filed 7/31/72.]

[Title 296 WAC—p. 1996]

WAC 296-133-030 Construction. These rules shall be liberally construed to effectuate the purposes and provisions of the act.

[Order 72-13, § 296-133-030, filed 7/31/72.]

WAC 296-133-040 General. Any terms used in these rules that are defined in the act shall have the same meaning as set forth therein.

[Order 72-13, § 296-133-040, filed 7/31/72.]

WAC 296-133-050 Petitioner. "Petitioner" shall mean any person, employer or employee association authorized to request the department to take action under the provisions of the act or these rules.

[Order 72-13, § 296-133-050, filed 7/31/72.]

WAC 296-133-060 Authorized agent. "Authorized agent" of the department shall mean the director, the supervisor of industrial relations, a labor mediator or a hearing officer specifically authorized by the director to conduct proceedings under the act.

[Order 72-13, § 296-133-060, filed 7/31/72.]

WAC 296-133-070 Employee association or organization—Qualifications. In order to qualify as an employee association as referred to in section 3 of the act, any such organization or association:

(1) Upon request by the authorized agent, or any party of interest, must produce authentic records of how, when and by whom the organization was formed.

(2) Shall have a written constitution and/or bylaws which plainly indicates that one of the primary purposes of the organization or association is to represent employees in labor relations matters with employers and is consistent with the requirements of the act and is available for review by any member.

(3) The constitution and/or bylaws must provide:

(a) An approved, customary or recognized method for the nomination and election of officers in accordance with accepted parliamentary procedures, the terms of such officers not to exceed four years.

(b) An approved method of financial record keeping and a financial audit at least once a year, which audit is available to any member for review.

(c) That at least four regular meetings must be held each year with adequate notice of meetings to all members.

(d) That a specific and reasonable minimum number of members or a percentage of the membership must be present to form a quorum before any organization business may be transacted at regular or special meetings.

[Order 72-13, § 296-133-070, filed 7/31/72.]

WAC 296-133-080 Bargaining representative—Selection of—Petition. Applications to the department regarding the selection of a bargaining representative to represent employees of a bargaining unit of an employer shall be by petition on such form or forms as may be provided by the department. A written petition may be accepted by the department if the petition contains substantially the same

information required by the forms provided by the department.

[Order 72-13, § 296-133-080, filed 7/31/72.]

WAC 296-133-090 Filing of petition. The petition for certification, decertification or amendment of certification of the representative of a bargaining unit must be filed either:

(1) With the Supervisor, Division of Industrial Relations, Department of Labor and Industries, General Administration Building, Olympia, Washington 98504; or

(2) If the health care activity is situated in western Washington with the Labor Mediator, Division of Industrial Relations, Department of Labor and Industries, 300 West Harrison Street, Seattle, Washington 98119; or

(3) If the health care activity is situated in eastern Washington with the Labor Mediator, Division of Industrial Relations, Department of Labor and Industries, North 1322 Post Street, Spokane, Washington 99207.

[Order 72-13, § 296-133-090, filed 7/31/72.]

WAC 296-133-100 Contents of petition—General. Petitions for the certification, decertification, or amendment of certification of an employee representative of a bargaining unit shall contain the following:

(1) A statement as to whether the petition is filed by a health care activities employee organization, a health care activities employee or a health care activities employer.

[Order 72-13, § 296-133-100, filed 7/31/72.]

WAC 296-133-110 Contents of petition filed by employer or employee organization. Petitions for certification decertification or amendment of certification filed by a health care activities employee organization or a health care activities employees, shall contain:

(1) A description of the bargaining unit which the petitioner claims to be appropriate, a statement as to whether there is any disagreement between the petitioner and interested parties as to the nature and scope of the proposed bargaining unit; and statement that the petitioner is authorized to represent at least thirty percent of the employees within the proposed bargaining unit.

(2) The names and addresses of any persons or employee organizations, known to the petitioner, who claim to represent any employees in the proposed appropriate bargaining unit; the expiration dates and brief descriptions of any collective bargaining agreements which may be in effect between an employer and an employee organization covering all or a portion of the employees in the proposed bargaining unit.

(3) The number and job titles of the employees in the proposed bargaining unit.

(4) A statement that the employer declines to recognize the petitioner as the employee representative, or that the health care activities employer is about to recognize another employee organization as the exclusive bargaining representative or the presently recognized or certified employee organization is no longer the representative of the employees in the proposed bargaining unit.

(5) The name, affiliation, if any, and the address of the petitioner.

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(6) Whether a work stoppage or picketing is in progress at the health care activity and, if so, the approximate number of employees participating and the date that such work stoppage or picketing commenced.

(7) Any other relevant factual information.

(8) A specific statement of the relief or remedy that the petitioner seeks the department to invoke.

[Order 72-13, § 296-133-110, filed 7/31/72.]

WAC 296-133-120 Contents of petition filed by employer. Petitions for certification or amendment of certification of a bargaining representative filed by a health care activities employer, shall contain:

(1) A factual statement setting forth that one or more individuals or employee organizations has presented to the petitioner a claim to be recognized as the exclusive bargaining representative of all employees in a bargaining unit claimed to be appropriate; the job titles of the employees of such bargaining unit; the number of employees in such unit; and a statement of reasons as to whether the petitioner agrees or disagrees as to the nature or scope of such requested bargaining unit.

(2) The name or names, affiliation, if any, and addresses of individuals or employee organizations known to the petitioner making such claim for recognition as to the exclusive bargaining representative of employees in the health care activity.

(3) A statement regarding whether the petitioner has contracts with any employee organization or other representatives of employees, and if so, the expiration dates of such agreements.

(4) A statement as to whether or not a work stoppage or picketing is in progress at the health care activity involved, and if so, the approximate number of employees participating, and the date such work stoppage or picketing commenced.

(5) A statement of other relevant facts.

(6) A statement regarding the remedy or relief the petitioner requests the department to invoke.

[Order 72-13, § 296-133-120, filed 7/31/72.]

WAC 296-133-130 Intervention. Any third party having a legitimate interest in any proceedings commenced under the act may file a petition seeking intervention in such proceedings setting forth facts sufficient to establish such interests and setting forth in such petition the remedy or relief the petitioner seeks the department to invoke.

For the purposes of third party intervention, "legitimate interest" means that the petitioner must allege in the petition for intervention and be prepared to prove if requested that it is authorized to represent at least thirty percent of the employees within a proposed bargaining unit before leave to intervene may be granted. Any employee organization which has a signed, valid collective bargaining agreement encompassing the proposed bargaining unit or any portion thereof shall be considered to have a legitimate interest upon presentation to the department of an executed authentic copy of such collective bargaining agreement.

[Order 72-13, § 296-133-130, filed 7/31/72.]

WAC 296-133-140 Conferences—Notice of hearing.

Upon the filing of petition for certification, decertification or amendment of certification of an exclusive bargaining representative of employees and the determination of an appropriate bargaining unit, an authorized agent shall confer with and may hold informal conferences with the known interested parties in an effort to ascertain the agreed upon facts of the controversy. The authorized agent shall encourage the parties to agree upon an appropriate bargaining unit within the limitations of the act. Whenever the authorized agent shall determine that the parties are unable to agree upon an appropriate bargaining unit, and is unable to settle the controversy without hearing, a hearing shall be conducted. Notice of such hearing, with the time and place of such hearing, shall be given to all parties by mail at least six days prior to the date of hearing, excluding Saturdays, Sundays and legal holidays. Within a reasonable time following the determination of an appropriate bargaining unit, the authorized agent shall provide for a bargaining representation election in accordance with the provisions of section 3 of the act and as further provided in these rules.

[Order 72-13, § 296-133-140, filed 7/31/72.]

WAC 296-133-150 Petition—Amendments or withdrawals. At any time prior to the issuance of the written notice of a bargaining representation election, a petitioning party may, subject to the discretion of the authorized agent, amend or withdraw his petition.

[Order 72-13, § 296-133-150, filed 7/31/72.]

WAC 296-133-160 Unit determinations—Considerations. Whenever the department is called upon to make a determination of an appropriate bargaining unit within a health care activity, within the limitations of the act, the department shall consider the duties, skills and working conditions of the health care activities employees; the history of collective bargaining by the health care activities employees and their bargaining representative within the proposed bargaining unit and in the health care industry; the extent of organization among the health care activities employees; the desires of such employees and the affect of the proposed bargaining unit upon the efficiency of administration of the health care activity.

[Order 72-13, § 296-133-160, filed 7/31/72.]

WAC 296-133-170 Representation questions—Timeliness. The department will not consider any question of representation within any bargaining unit or subdivision thereof in any health care activity within which in the preceding twelve-month period a valid election has been held. Nor will the department entertain any petition giving rise to the question of representation within any bargaining unit or portion thereof with a health care activity having a collective bargaining agreement in effect, except during the period not more than ninety nor less than sixty days prior to the expiration date of any such agreement. A collective bargaining agreement which contains a provision for automatic renewal or extension of the agreement or which is effective for a term of more than three years shall not be deemed to be a valid collection bargaining agreement for the purposes of this section.

[Title 296 WAC—p. 1998]

[Order 72-13, § 296-133-170, filed 7/31/72.]

WAC 296-133-180 Employee lists. Health care activities employers shall furnish a current list of the names and addresses of all employees in a proposed or agreed upon bargaining unit prior to any scheduled representation hearing. The lists of such employees shall be available upon request to any organization which has been qualified under these rules and meeting the requirements of section 3 of the act.

[Order 72-13, § 296-133-180, filed 7/31/72.]

WAC 296-133-190 Authorization cards—Acceptability. In order to be acceptable as evidence of representation for the purposes of the thirty percent requirements of section 3 of the act, individual authorization cards must be signed and dated by the employee expressing his intention to be represented by a specific bargaining representative. A card signed and dated six months or more prior to the date on which examination of cards for representation purposes commences shall be considered invalid and not acceptable for representation purposes.

[Order 72-13, § 296-133-190, filed 7/31/72.]

WAC 296-133-200 Conduct of election. In the event a representation election is conducted for the purposes of certification, the following rules shall apply:

(1) Notice of election shall be given to all interested parties, and shall be prominently posted by the employer at a place or places within the health care services facility reasonably accessible to all employees. Notices of election shall be sent by mail to all interested parties no less than ten days prior to the date of the election excluding Saturdays, Sundays and legal holidays. Notices of election shall contain the following information; the date of election, hours and place of election, a list of employees eligible to vote, a description of the bargaining unit and a listing of employee organizations from which eligible employees may choose by ballot as well as a choice that such employees do not wish to be represented by any bargaining representative.

(2) Employee shall be deemed eligible to vote in an election for the certification of an exclusive bargaining representative of the employees of an appropriate bargaining unit who are regularly employed within the bargaining unit, either full or part time, and who are in the employ of the employer within fourteen days prior to the date of the issuance of the notice of election and on the date of election, except, supervisors as defined in section 2, subsection 5 of the act, and guards as defined in section 2, subsection 6 of the act, unless the bargaining unit is exclusively devoted to employees serving in the capacity of guards. Employees otherwise eligible to vote in a certification election may be permitted to vote by absentee ballot upon the filing of an affidavit with the authorized agent indicating that such person is eligible to vote in the certification election and that by reason of physical incapacity will be unable to be present at the balloting place on the date of election. The casting of ballots in a representation election by proxy will not be permitted.

(3) Each of the interested parties may designate one person as observer at the polls. Unless otherwise stipulated by

the interested parties, observers must be nonsupervisory employees of the health care activities employer.

(4) Any observer, or the authorized agent, for good cause may challenge any employee's eligibility to vote. A challenged ballot shall be placed in an envelope bearing no identifying marks. It shall be placed in another envelope upon which shall be written the name of the employee desiring to cast a ballot, the reasons for which the ballot was challenged, by whom it was challenged, the polling place at which it was challenged, and the envelope shall be sealed and initialed by the authorized agent.

(5) The challenged ballots previously placed in separate envelopes shall be placed in a sealed envelope marked "challenged ballots" and sent along with the tally sheet to the authorized agent. The challenged ballots shall not be opened or counted unless the counting of such ballots might affect the results of the election. If the challenged ballots might affect the results of the election, the authorized agent shall conduct an investigation into and if requested conduct a formal hearing on the validity of the challenges made. If it is concluded that the challenge was properly made, that ballot shall be excluded from the count. Otherwise, such ballot shall be counted as cast.

(6) Ballots may not be tallied until after the time for the closing of the polls unless all eligible voters have cast their ballot.

(7) Within five days after the tally of the ballots has been furnished, any party may file with the authorized agent an original and three copies of objections to the conduct of the election, or conduct affecting the results of the election, which shall contain a short factual statement of the reasons for the objections. Such filing must be timely, whether or not the challenged ballots are sufficient in number to affect the results of the election. Copies of such objections shall immediately be served by mail upon the other parties by the party filing them. If objections are filed to the conduct of the election, or conduct affecting the result of the election, the authorized agent shall investigate such objections. If the objections to the conduct of the election were sustained and the objections would affect the results of the election, the authorized agent, if requested by one of the interested parties, shall conduct a formal hearing.

[Order 72-13, § 296-133-200, filed 7/31/72.]

WAC 296-133-210 Run-off election procedure. Where more than one employee organization is on the ballot, and neither of the three or more choices receives votes from a majority of the votes cast in the election, a run-off election shall be held. The run-off ballot shall contain the two choices which receive the largest and second largest number of votes.

[Order 72-13, § 296-133-210, filed 7/31/72.]

WAC 296-133-220 Certification. If no timely objections are filed, the authorized agent will certify, as an exclusive bargaining representative, the employee organization which receives votes from a majority of the employees who vote in the election or any run-off election or will certify that no employee organization receive votes from a majority of the employees who voted in the election or any run-off election. A copy of such certification shall be mailed to all inter-

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ested parties within ten days of certification, along with a certification of the results of the election.

[Order 72-13, § 296-133-220, filed 7/31/72.]

WAC 296-133-230 Unfair labor practices—Who may file. Any employee or employee organization or a health care activities employer may file in writing an unfair labor practice charge with the department of labor and industries, alleging an unfair labor practice as set forth in the applicable provisions of sections 4 and 5 of the act: *Provided*, That this section and other sections of these rules relating to unfair labor practice charges, shall not be construed to prohibit an employee, an employee organization or an employer from instituting court proceedings as authorized under section 7 of the act without first having exhausted the remedies provided by these rules, except, in those cases in which an employee, an employee organization or an employer requests the director of labor and industries to exercise the authority invested in him to institute court proceedings to seek relief from the commission of an unfair labor practice. Any decision by a court rendered upon the merits of an unfair labor practice charge pursuant to a legal action instituted under the authority of section 7 shall be deemed res judicata and a bar to maintaining proceedings under this section and other sections of these rules relating to unfair labor practice charges.

[Order 72-13, § 296-133-230, filed 7/31/72.]

WAC 296-133-240 Filing of charges. Unfair labor practice charges shall be filed on such form or forms provided by the department and shall contain the following:

- (1) The name and address of the health care activities employer.
- (2) The name and address of the person or organization who is filing the charges.
- (3) The statement as to the basis of the charge which shall be specific as to facts, names, addresses, dates and places.
- (4) A statement as to whether or not the complainant has instituted legal proceedings under the authority of section 7 of the act seeking relief from the alleged commission of an unfair labor practice.
- (5) The unfair labor practice charges shall be verified under oath in substantially the following form:

....., being first sworn on oath, deposes and says: That he is the complainant named in the foregoing unfair labor practice charges, that he has read the unfair labor practice charges, knows the contents thereof and believes the same to be true and correct to the best of his knowledge and belief.

.....
(Signature of Complainant)

Subscribed and sworn to before me on this
..... day of 1972.

.....
Notary Public in and for the
State of Washington, Residing
at

[Order 72-13, § 296-133-240, filed 7/31/72.]

WAC 296-133-250 Actionable charges—Dismissals.

Upon receipt of an unfair labor practice charge, the department shall determine whether or not the complainant has alleged actionable charges of unfair labor practices under the provisions of the act. If the department finds that actionable charges have been alleged by the complainant, the department may give notice of not less than three days to the parties to the controversy that an informal hearing conference will be held at which conference testimony and evidence will be taken under oath to determine whether such charges are factually meritorious or frivolous. If the charges are found to be actionable charges and the evidence obtained at the informal hearing conference discloses that the charges are made in good faith and give rise to substantial questions of fact or law, the department shall issue a complaint and schedule the matter for hearing. If the informal hearing conference discloses that the unfair labor practice charges are frivolous and not made in good faith and do not give rise to substantial questions of fact or law, the unfair labor practice charges shall be dismissed and those persons or organizations named in such charges shall be notified in writing of such dismissal and the reasons for the dismissal. If the department finds that actionable charges have not been alleged under the provisions of the act, the unfair labor practice charges shall be dismissed and those persons or organizations named in such charges shall be notified in writing of such dismissal and the reasons for the dismissal.

[Order 72-13, § 296-133-250, filed 7/31/72.]

WAC 296-133-260 Remedial orders. Remedial orders may be issued by the department which shall afford an appropriate remedy or relief consistent with the provisions of the act and the findings and conclusions of the authorized agent, which may include the prominent posting of such remedial orders within the health care activity at such place or places reasonably accessible to all employees for periods of time not to exceed six months.

[Order 72-13, § 296-133-260, filed 7/31/72.]

WAC 296-133-270 Extensions of time. Whenever in these rules provision is made for the conducting of a hearing by the authorized agent for the purpose of taking testimony and evidence after the giving of a notice of the time and place of such hearing, the authorized agent may upon his own motion change the time for such hearing to a later date and change the place for such hearing. In addition, any party to the hearing process may upon written application to the authorized agent upon the basis of good cause shown in such application be granted an extension of time and a change of the date or place or both for such hearing which is reasonably convenient to the parties.

[Order 72-13, § 296-133-270, filed 7/31/72.]

WAC 296-133-280 Impasse-determination. Whenever either a health care activities employer or the exclusive bargaining representative of the bargaining unit of such health care activity are of the opinion that an impasse has arisen between the parties in the process of collective bargaining, either party may request the department in writing to deter-

mine whether an impasse exists in the collective bargaining process.

For the purpose of these rules and supplementary to section 9 of the act, an impasse in the collective bargaining process will be presumed to have been reached when the parties have not agreed upon a collective bargaining contract and an issue or issues remain upon which neither party is willing to agree, nor make in good faith concessions or make further concessions in good faith, nor agree upon any good faith proposal nor make further proposals in good faith for the settlement of any issue remaining unresolved.

For the purpose of these rules and supplementary to the act, the terms "collective bargaining" means the performance of the mutual obligations of the employer and the bargaining representative of the employees to meet at reasonable times, to confer in good faith with respect to wages, hours and other terms and conditions of employment, or the negotiations of an agreement, or any question arising thereunder, and the execution of a written contract incorporating any agreement reached, but such obligation does not compel either party to agree to a proposal or require the making of a concession.

In any case in which the department is requested to determine whether an impasse has been reached in the collective bargaining process, the authorized agent shall request the parties representing the employer, and the parties representing the exclusive bargaining representative in the negotiations to meet and confer with the authorized agent for the purpose of an informal hearing conference to enable a determination of the facts to be made as to whether an impasse has been reached in the collective bargaining process. For that purpose the authorized agent may take evidence and testimony under oath. If the authorized agent determines that an impasse has been reached in the collective bargaining process, he shall forthwith enter findings and conclusions forming the basis of his belief that an impasse has been reached and setting forth therein the specific issues remaining unresolved between the parties which constitute the impasse accompanied by an order declaring an impasse and ordering the parties to forthwith choose and impanel a board of arbitrators pursuant to the provisions of section 9 of the act. Which order shall further require the parties to furnish copies of the authorized agent's findings and conclusions and order declaring an impasse to each member of the panel of arbitrators for their guidance upon the subject of the issues remaining unresolved constituting the impasse.

If an impasse is found not to have been reached in the process of collective bargaining, the authorized agent shall enter findings and conclusions and order the parties to resume the process of collective bargaining.

[Order 72-13, § 296-133-280, filed 7/31/72.]

WAC 296-133-290 Administrative appeals to the director. Any employer or employee of a health care activity or employee organization or other person or organization who was a party in the proceeding before the authorized agent and aggrieved by any action taken or decision made by any authorized agent may appeal such action or decision to the director of the department of labor and industries by filing a notice of such appeal with the director of the department of labor and industries and the authorized agent within thirty

days of such action or decision. The notice of appeal shall be accompanied by a concise numbered statement of the assignments of error which are to be relied upon and are the subject of the appeal. Copies of the notice of appeal and assignments of error shall be served upon all parties to the proceeding before the authorized agent. Proof of such service shall be filed in the office of the director. The notice of appeal may in the discretion of the director suspend such action or decision of the authorized agent pending the determination of the appeal by the director. The director shall review the record and written briefs on appeal filed by the respective parties and may bear oral argument regarding the issues on appeal. The director shall decide the issues raised by the appeal and shall notify all parties in writing of his decision. The decision of the director in the absence of an appeal to the superior court pursuant to the Administrative Procedure Act shall be final at the expiration of thirty days from the date of filing of such decision.

[Order 72-13, § 296-133-290, filed 7/31/72.]

WAC 296-133-300 Appeal briefs. Typewritten memoranda of authority or appeal briefs shall be filed in the office of the director by the respective parties to the appeal thirty days following the filing of the notice of appeal. Any party to the appeal filing an appeal brief may request that a hearing of oral arguments upon the appeal be held before the director. Parties to the appeal not filing an appeal brief will not be granted oral hearing of arguments before the director nor permitted to present oral arguments to the director at any hearing that may be held for the presentation of arguments on appeal. The time and place for hearing oral arguments, when requested, will be fixed at the expiration of the time for filing briefs and notice of any such hearing will be sent to all parties to the appeal.

[Order 72-13, § 296-133-300, filed 7/31/72.]

WAC 296-133-310 Appeal briefs—Contents. In addition to the cover or title pages of the brief and any index, appeal briefs shall consist of the following subdivisions, titled with distinctive type and in the order indicated:

(1) Statement of the case. Under this heading the following shall be included: A brief statement of the nature of the case which is the subject of the appeal and a clear and concise statement of the facts appropriate to an understanding of the nature of the controversy, with page references to the record on appeal.

(2) Assignments of error. Each error relied upon and served with the notice of appeal shall be clearly pointed out and discussed under the appropriately designed headings. No alleged error of the authorized agent will be considered unless the same be definitely pointed out in the assignments of error in the appellant's brief. Whenever error is assigned to any findings of fact or conclusion of the authorized agent, so much of the findings or conclusions claimed to be erroneous shall be set out verbatim in the brief.

(3) Argument of counsel for appellant shall set forth and discuss the authorities in support of the position of the appellant and shall be appropriately designed and arranged for discussion and argument of the assignments of error and the

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issues arising out of such assignments of error with references where appropriate to the record on appeal.

(4) Argument of counsel for respondent. The brief of respondent on appeal need not contain a subdivision containing the assignments of error on appeal, but in the argument of counsel for respondent there shall be directed, under appropriately titled sections, argument and discussion in opposition to the assignments of error of the appellant, or in support of the decision of rulings of the authorized agent and where appropriate with supporting references to the pages of the record on appeal.

[Order 72-13, § 296-133-310, filed 7/31/72.]

WAC 296-133-320 Record on appeal. Upon receipt of a copy of the notice of appeal, the authorized agent shall promptly cause to be prepared and forwarded to the office of the director the record on appeal which shall include, a transcript of the proceedings of any hearing held by the authorized agent, the originals of all exhibits or documentary evidence admitted in evidence or rejected in evidence by the authorized agent and any other papers or evidence before the authorized agent relied upon in arriving at his decision. All exhibits shall be appropriately and plainly marked for reference. In addition the authorized agent shall certify in the appropriately titled case the record on appeal as containing all of the evidence, matters and things coming before the authorized agent at the hearing, or relied upon in making his findings, conclusions, decision and any remedial order. A copy of the record on appeal, or any portion thereof, may be obtained by any party to the appeal upon payment to the authorized agent of the reasonable cost per page.

[Order 72-13, § 296-133-320, filed 7/31/72.]

Chapter 296-134 WAC FAMILY LEAVE

WAC

296-134-001	Declaration of purpose.
296-134-010	Definitions.
296-134-030	Entitlement to leave.
296-134-040	Notice.
296-134-050	Medical confirmation.
296-134-060	Leave from same employer.
296-134-070	Returning to employment.
296-134-090	Penalties.

WAC 296-134-001 Declaration of purpose. It is in the public interest that employers provide reasonable leave upon the birth or adoption of a child or to allow for the care of a child under eighteen years old with a terminal health condition. This chapter serves to implement chapter 11, Laws of 1989 1st ex. sess., establishing a minimum standard for employee leave in furtherance of family stability and economic security.

These rules are not comprehensive and should be implemented in conjunction with the statutory requirements of chapter 49.78 RCW.

[Statutory Authority: 1989 1st ex.s. c 11, 89-23-044, § 296-134-001, filed 11/13/89, effective 12/14/89.]

WAC 296-134-010 Definitions. For the purposes of this chapter:

[Title 296 WAC—p. 2001]

(1) "Chapter" means this chapter of the Washington Administrative Code or chapter 11, Laws of 1989 1st ex. sess.

(2) "Department" means the department of labor and industries.

(3) "Employee" means a person, other than an independent contractor, employed by an employer on a continuous basis for the previous fifty-two weeks for at least an average of thirty-five hours a week. In computing the average number of hours worked, hours over fifty hours a week shall not be included.

A person is employed on a continuous basis despite a temporary interruption in the performance of the person's job duties if (a) the interruption is caused by the employee taking authorized leave; (b) the interruption is caused by the employer's temporary cessation of all or most operations and the employees do not qualify for unemployment compensation benefits due to a continuing employment relationship, e.g., school employees; or (c) the employee qualified for unemployment compensation benefits as a "stand-by" worker as defined in WAC 192-12-150 for time periods of two weeks or less.

(4) "Employer" means any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state, and any unit of local government, which (a) employed a daily average on one hundred or more employees during the last calendar quarter at the place where the employee requesting leave reports for work, or (b) employed a daily average of one hundred or more employees within a twenty mile radius of the place where the employee requesting leave reports for work, the employer maintains a central hiring location and customarily transfers employees among workplaces.

Any employer that has demonstrated the ability to transfer employees between workplaces within the twenty mile radius for the purpose of covering a temporary labor shortage or a permanent or temporary reassignment is considered to be an employer that customarily transfers employees.

A "central hiring location" is an office of the employer or its agent where two or more of the following functions are performed for two or more workplaces:

- (i) Employment applications are accepted or screened;
- (ii) Preemployment or employment interviews are conducted;
- (iii) Hiring decisions are made.

"Employer" also includes the state, state institutions, and state agencies.

(5) "Infraction" means a violation of chapter 11, Laws of 1989 1st ex. sess. or this chapter, as found by the department.

(6) "Workweek" means a fixed and regularly recurring period of one hundred sixty-eight hours or seven consecutive twenty-four hour periods. It may begin on any day of the week and any hour of the day, and need not coincide with a calendar week.

[Statutory Authority: 1989 1st ex.s. c 11. 89-23-044, § 296-134-010, filed 11/13/89, effective 12/14/89.]

WAC 296-134-030 Entitlement to leave. (1) Subject to restrictions within the statute and these rules, an employee is

entitled to twelve workweeks of family leave during any twenty-four month period. Use of family leave shall not preclude an employee from using other leave to which the employee is entitled during that period according to the terms of the appropriate collective bargaining agreement or employer leave policy.

(2) Employers may limit or deny family leave to designated key personnel or the highest paid ten percent of the employer's employees in the state.

(a) Designated key personnel may not exceed ten percent of the employer's employees in the state. Key personnel shall be designated based upon criteria determined by the employer which may not include the employee's age or gender or other criteria for the purpose of evading the requirements of this chapter. Any designation of key personnel shall take effect thirty days after the employee is notified.

(b) If the employer chooses to limit or deny family leave to the highest paid ten percent of the employer's employees within the state, the employer shall within forty-five days after a determination notify the employees who fall within the highest paid ten percent. In calculating the highest paid ten percent of the employer's employees within the state, the employer shall include total wages, salary, or bonuses paid. An employer may not limit or deny family leave to the highest paid ten percent of the employer's employees until thirty days after the employees are notified. The notice shall be good for up to one year regardless of changes in compensation and may be changed no more than once in any twelve-month period.

[Statutory Authority: 1989 1st ex.s. c 11. 89-23-044, § 296-134-030, filed 11/13/89, effective 12/14/89.]

WAC 296-134-040 Notice. (1) An employee planning to take family leave to care for a newborn or newly adopted child shall provide the employer with written notice at least thirty days in advance of the anticipated date of delivery or adoption, stating the dates during which the employee intends to take family leave. This notice is not intended to substitute for notice to take maternity disability leave which an employer may require.

(2) Failure of an employee to provide written notice of the intention to take family leave for any authorized reason shall allow an employer to increase or reduce the leave requested by up to three weeks.

[Statutory Authority: 1989 1st ex.s. c 11. 89-23-044, § 296-134-040, filed 11/13/89, effective 12/14/89.]

WAC 296-134-050 Medical confirmation. An employer seeking confirmation by an employee's health care provider regarding the date of a child's birth, the date on which incapacity or disability commenced or will probably commence and its probable duration, or the fact that a child has a terminal health condition, shall notify the employee within seven calendar days or five working days of receipt of the employee's notice of leave except where the employer requires medical confirmation as part of the initial leave request. If disputes arise regarding premature birth, incapacitation of the mother, maternity disability, or the terminal condition of a child, the opinions of additional health care providers shall be obtained within fourteen calendar days or ten

working days of the employer's receipt of the opinion of the employee's health care provider except where the employee is unable to schedule an appointment or otherwise fails to cooperate or where the employee's doctor is responsible for the delay.

[Statutory Authority: 1989 1st ex.s. c 11. 89-23-044, § 296-134-050, filed 11/13/89, effective 12/14/89.]

WAC 296-134-060 Leave from same employer. When both parents of a child are employed by the same employer, the employer may limit the family leave to a total of twelve workweeks during a twenty-four month period. For purposes of this section, an "employer" is the same entity as that defined in WAC 296-134-010(4) for determining the scope of this chapter. Each state agency or institution shall be considered a separate employer.

[Statutory Authority: 1989 1st ex.s. c 11. 89-23-044, § 296-134-060, filed 11/13/89, effective 12/14/89.]

WAC 296-134-070 Returning to employment. (1) Subject to the exceptions in subsections (2) and (3) of this section, an employee who exercises any right to family leave under this chapter shall be entitled, upon return from leave or during any reduced leave schedule, to the same position, with the same pay, benefits, hours and shift, as held when the leave commenced, or to a position with equivalent benefits and pay at a workplace within twenty miles of the employee's workplace when leave commenced. Upon a written request of the employee, the employer shall provide a written explanation to the employee if the employee is not allowed to return to the same position.

(2) If the employer's circumstances have changed so that the employee cannot be reinstated to the same position or to a position with equivalent pay and benefits, an employee returning from family leave shall be reinstated in any position which is vacant and for which the employee meets the minimum qualifications. The filling of a position held by an employee on family leave does not by itself constitute changed circumstances.

(3) Reinstatement of an employee returning from family leave need not occur as provided under subsection (1) or (2) of this section if:

(a) The specific job is eliminated by a bona fide restructuring, or a reduction-in-force resulting from lack of funds or lack of work;

(b) The employee's workplace is completely shut down at the time for at least thirty days;

(c) The employer moves the workplace of the employee to a location at least sixty miles from the location of the workplace with leave commenced;

(d) An employee on family leave takes a position with another employer outside the home; or

(e) The employee fails to provide the required notice of intent to take family leave or fails to return on the established ending date of leave.

[Statutory Authority: 1989 1st ex.s. c 11. 89-23-044, § 296-134-070, filed 11/13/89, effective 12/14/89.]

WAC 296-134-090 Penalties. (1) The department may fine an employer up to two hundred dollars for the first infraction of this chapter or its enabling legislation.

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(2) An employer that commits three or more infractions within a two-year period shall be considered an employer that continues to violate the statute, subject to a fine of up to one thousand dollars for each infraction. An infraction that affects more than one employee and that an employer refuses to correct within a reasonable time after notification by the department, such as the employer's refusal to display in a conspicuous place a poster informing employees of their rights under this chapter, shall also constitute a continuing violation, subject to a fine of up to one thousand dollars for each day the infraction continues.

[Statutory Authority: 1989 1st ex.s. c 11. 89-23-044, § 296-134-090, filed 11/13/89, effective 12/14/89.]

Chapter 296-150C WAC COMMERCIAL COACHES

WAC

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296-150C-0040	Will you keep my manufacturing information confidential?
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296-150C-0070	Do you have reciprocal agreements with other states to inspect commercial coaches?
296-150C-0080	Do you allow a local enforcement agency to inspect commercial coaches at the manufacturing location?
296-150C-0100	What happens if I disagree with your decision regarding my compliance with this chapter?
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296-150C-0120	Where can I obtain technical assistance regarding commercial coaches?

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296-150C-0200	Who must obtain commercial coach insignia?
296-150C-0210	What are the insignia requirements?
296-150C-0220	How do I obtain insignia information and the required forms?
296-150C-0230	What are the insignia application requirements?
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296-150C-0430	What information must a professional or firm provide to be authorized to approve design plans?

296-150C-0440	How will I know whether I am authorized to approve design plans?	296-150C-1120	Kitchen cabinet protection.
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296-150C-0510	How do I request an inspection?	296-150C-1190	Interior privacy.
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296-150C-1740	What are the mechanical requirements for a vendor unit?
296-150C-1750	What are the LPG system enclosure and mounting requirements for a vendor unit?
296-150C-1751	What are the fuel gas piping design requirements for a vendor unit?
296-150C-1752	Can gas tubing be concealed in a vendor unit?
296-150C-1753	What are the pipe-joint compound requirements for gas piping in a vendor unit?
296-150C-1754	What are the gas piping hanger and support requirements for a vendor unit?
296-150C-1755	What are the electrical bonding requirements for gas piping in a vendor unit?
296-150C-1756	How are gas supply connections in a vendor unit identified?
296-150C-1757	What requirements apply to gas piping system openings?
296-150C-1758	Are gas piping shut-off valves required in a vendor unit?
296-150C-1759	What requirements apply to testing for gas piping leaks before vendor unit appliances are connected?
296-150C-1760	What requirements apply to testing for gas piping leaks after vendor unit appliances are connected?
296-150C-1770	Appliances—Installation.
296-150C-1780	Safety devices—Water heater relief valves.
	PLUMBING
296-150C-1790	Plumbing—General.
296-150C-1800	Plumbing—Definitions.
296-150C-1810	Drainage—Cap or plug.
296-150C-1820	Drainage—Clearance from drain outlet.
296-150C-1830	Water supply connection.

COMMERCIAL COACH FEES

296-150C-3000	Commercial coach fees.
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DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-150C-0980	Wall coverings. [Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0980, filed 10/23/96, effective 11/25/96.] Repealed by 98-14-078, filed 6/30/98, effective 7/31/98. Statutory Authority: Chapter 43.22 RCW.
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WAC 296-150C-0010 Authority, purpose, and scope.

(1) This chapter is authorized by RCW 43.22.340 through 43.22.435 covering the construction, alteration and approval of commercial coaches sold, leased, or used in Washington state.

(2) This chapter applies to the approval of commercial coach manufacturers, dealers and to any person who manufactures or alters the plumbing, mechanical, or electrical system or the body or frame of a commercial coach.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0010, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0020 What definitions apply to this chapter? "Alteration" is the replacement, addition, modification, or removal of any equipment or installation that

affects the construction, fire and life safety, or the plumbing, mechanical, and electrical systems of a commercial coach.

The following are not considered alterations:

- Repairs with approved parts;
- Modification of a fuel-burning appliance according to the listing agency's specifications; or
- Adjustment and maintenance of equipment.

"Approved" is approved by the department of labor and industries.

"Building site" is a tract, parcel, or subdivision of land on which a commercial coach will be installed.

"Consumer" is a person or organization, excluding a manufacturer or dealer of commercial coaches, who buys or leases a commercial coach.

"Commercial coach" is a structure (referred to as a unit) that:

- Can be transported in one or more sections;
- Is used for temporary commercial purposes;
- Is built on a permanent chassis;
- Conforms to the construction standards of this chapter;
- May include plumbing, mechanical, electrical and other systems; and
- Includes Type A and Type B vendor units.

Type A vendor unit is a commercial coach vehicle such as, but not limited to, a truck, van, or step van. The maximum dimensions of a Type A vendor unit are 8 feet wide by 24 feet long in the set-up mode.

Type B vendor unit is a commercial coach structure such as, but not limited to, a recreational vehicle as defined by the American National Standards Institute, Inc. that is being converted to a vendor unit. The maximum dimensions of a Type B vendor unit are 8 feet wide by 24 feet long in the set-up mode.

Note: A commercial coach may not be used as a single-family dwelling. A commercial coach does not have to be placed on a permanent foundation.

Note: (1) Nonvendor units must comply with chapter 296-150C WAC, WAC 296-150C-0010 through 296-150C-1570 and WAC 296-150C-3000.

(2) Vendor units may comply with chapter 296-150C WAC, WAC 296-150C-0010 through 296-150C-1570 or WAC 296-150C-0010 through 296-150C-0710 and WAC 296-150C-1580 through 296-150C-3000.

"Damaged in transit" means damage that affects the integrity of a structural design or any of the systems.

"Dealer" is a person, company, or corporation whose business is leasing, selling, offering for lease or sale, buying, or trading commercial coaches.

"Department" is the department of labor and industries. The department may be referred to as "we" or "us" in this chapter. Note: You may contact us at: Department of Labor and Industries, Specialty Compliance, PO Box 44440, Olympia, WA 98504-4440.

"Design plan" is a plan for the construction or alteration of a commercial coach or conversion of a vehicle to a commercial coach including floor plans, elevation drawings, specifications, engineering data, or test results necessary for a complete evaluation of the design.

"Design option" is a design that a manufacturer may use as an option to its commercial coach design plan.

"Equipment" is all material, appliances, devices, fixtures, fittings, or accessories used in the manufacture, assembly, conversion to, or alteration of a commercial coach.

"Factory assembled structure (FAS) advisory board" is a board authorized to advise the director of the department regarding the issues and adoption of rules relating to commercial coaches. (See RCW 43.22.420.)

"Insignia" is a label that we attach to a commercial coach to verify that the structure meets the requirements of this chapter and the applicable codes.

"Install" is to erect, construct, assemble, or set a commercial coach in place.

"Labeled" is to bear the department's insignia.

"Listed" is a piece of equipment or apparatus that has been approved by a testing agency to the appropriate standard.

"Local enforcement agency" is an agency of city or county government with power to enforce local regulations governing the installation of a commercial coach.

"Master design plan" is a design plan that expires when a new state building code has been adopted.

"One-year design plan" is a design plan that expires one year after approval or when a new state building code has been adopted.

"System" is part of a commercial coach designed to serve a particular function. Examples include structural, plumbing, electrical, or mechanical systems.

"Vendor unit" is a type of commercial coach (referred to as a unit) that:

- Is transported in only one section;
- Is designed for highway use;
- Is temporarily occupied for distribution of items (e.g., food);
- Is built on a permanent chassis;
- Includes at least one of the following systems: Plumbing, mechanical, or electrical;
- Is a converted structure, not a newly manufactured structure; and
- Is a Type A vendor unit or a Type B vendor unit.

Note: Newly manufactured units must comply with the commercial coach construction requirements of this chapter. Unoccupied vendor units are exempt from the requirements of this chapter. For example, those vehicles where food is sold and distributed by standing alongside it.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-0020, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0020, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0030 How is this chapter enforced?

(1) To enforce this chapter, we or another governmental inspection agency will inspect each commercial coach manufactured, sold, leased, or used in Washington state as required by this chapter. (See WAC 296-150C-0070 - reciprocal agreements.)

(2) We will inspect all commercial coach alterations.

(3) We will conduct inspections during normal work hours or at other reasonable times.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0030, filed 10/23/96, effective 11/25/96.]

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WAC 296-150C-0040 Will you keep my manufacturing information confidential? We will only release manufacturing information such as design plans, specifications, and test results according to the requirements of the Public Records Act (see RCW 42.17.310 (1)(h)) unless we are ordered to do so by a court or otherwise required by law.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150C-0040, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0040, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0050 Can you prohibit the sale or lease of my commercial coach? (1) We may prohibit the sale or lease of your commercial coach because it is unlawful for any person to sell, lease, or offer for sale a commercial coach within this state if it violates any of the requirements of this chapter. (See RCW 43.22.345.)

(2) If an inspection reveals that a commercial coach violates this chapter, we may post a notice prohibiting the sale or lease of a commercial coach.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0050, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0060 Who handles consumer complaints about commercial coaches? (1) Consumer may file complaints within one year of the date of manufacture.

(2) The complaint should be in writing and describe the item(s) that may not comply with this chapter.

(3) After we receive the complaint, we will send the manufacturer and the dealer a copy of the complaint.

(4) The manufacturer and/or dealer have thirty days to respond. We shall base our actions on the response.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0060, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0070 Do you have reciprocal agreements with other states to inspect commercial coaches?

(1) We have entered into reciprocal agreements with states who have inspection standards equal or greater than our standard.

(2) When we have a reciprocal agreement with another state:

(a) The reciprocal state inspects the commercial coaches manufactured in that state before shipment into Washington to ensure compliance with our laws. After inspection, the reciprocal state applies our insignia.

(b) The department inspects commercial coaches manufactured in Washington before shipment into the reciprocal state to ensure compliance with their laws. After inspection, we apply the insignia of the reciprocal state.

(3) We have reciprocal agreements on file.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0070, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0080 Do you allow a local enforcement agency to inspect commercial coaches at the manufacturing location? (1) A local enforcement agency (city or county), under contract with us, can inspect commercial

coaches. In some cases, their contract may be limited to specific portions of an inspection at specified manufacturing locations.

(2) After approving a unit, the local enforcement agency will attach the insignia, which indicates that the unit has passed inspection.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0080, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0100 What happens if I disagree with your decision regarding my compliance with this chapter? (1) If we determine that you are in violation of this chapter, you will receive a notice of noncompliance. (See WAC 296-150C-0560.)

(2) If you disagree with our decision, you can send us a written request for a hearing, stating why you disagree.

(3) After we receive your hearing request, we will:

(a) Schedule a hearing within thirty days after we receive your request.

(b) Notify you of the time, date, and place for the hearing. If you fail to appear, your case will be dismissed.

(c) Hear your case.

(d) Send you written notice of our decision.

If you disagree with our decision, you may appeal it under the Administrative Procedure Act (chapter 34.05 RCW).

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150C-0100, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0100, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0110 Do you have an advisory board to address commercial coach issues? The factory assembled structures (FAS) board advises us on issues relating to body and frame design, construction, alterations, plumbing, mechanical, electrical, installation, inspections, and rule adoption for commercial coaches. (See RCW 43.22.420.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0110, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0120 Where can I obtain technical assistance regarding commercial coaches? We offer field technical service to commercial coach manufacturers for an hourly fee. (See WAC 296-150C-3000.) Field technical service may include evaluation, consultation, plan examination, interpretation, and clarification of technical data relating to the application of our rules. It does not include inspections.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0120, filed 10/23/96, effective 11/25/96.]

INSIGNIA

WAC 296-150C-0200 Who must obtain commercial coach insignia? (1) You must obtain an insignia from us for each commercial coach manufactured, sold, leased, or used in Washington state.

(2) You do not need an insignia for a commercial coach:

(a) When a unit has been used outside of the state for six months before being brought into Washington state (see RCW 43.22.380); or

(b) If a unit was manufactured prior to July 1, 1968. (See RCW 43.22.370.)

Note: All commercial coaches must have insignia if they are altered, this includes the exceptions in subsection (1)(a) and (b) of this section.

(3) You must obtain an insignia when commercial coaches are altered in Washington state.

(4) You must obtain an alteration insignia when a commercial coach is damaged in transit after leaving the manufacturing location or during an on-site installation, and an alteration or repair is necessary. The insignia indicates the commercial coach was altered or repaired.

(5) You must have an approved design plan and pass our inspection before we will attach an insignia.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0200, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0210 What are the insignia requirements? (1) If you are applying for insignia, you must have your design plan approved and your commercial coach inspected and approved by us.

(2) If you are a manufacturer, dealer or owner applying for an alteration insignia, your alteration must be inspected and approved by us. Approval of the design plan may also be required.

(3) We will attach the insignia to your commercial coach after:

(a) We receive the required forms and fees from you (see WAC 296-150C-3000); and

(b) Your commercial coach has passed final inspection.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0210, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0220 How do I obtain insignia information and the required forms? Upon request, we will provide you with a packet of information that includes the required forms.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0220, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0230 What are the insignia application requirements? (1) If you are requesting insignia for commercial coaches that you intend to manufacture under a *new design plan*, your completed application must include:

(a) A completed design-plan approval request form;

(b) One complete set of design plans, specifications, engineering analysis, and test procedures and results, plus one additional set for each manufacturing location where the design plan will be used.

(c) At least one set of design plans must have an original wet stamp from a professional engineer or architect licensed in Washington state. We will retain the set with the original wet stamp; and

(d) A one-time initial filing fee, the design-plan fee (if you want us to approve your design plan), and the fee for each insignia. (See WAC 296-150C-3000.)

(2) If you are requesting insignia under an *approved design plan*, your completed application must include:

- (a) A completed insignia application form; and
- (b) The fee for each commercial coach insignia (see WAC 296-150C-3000).

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0230, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0240 What documentation do you need to perform an alteration inspection? (1) If you alter a commercial coach, we must inspect the alteration.

(2) Before we perform an alteration inspection and attach an alteration insignia, you must send us:

- (a) A description of the proposed alteration;
- (b) Applicable specifications, engineering analysis, test procedures and results for design-plan review;
- (c) The plan review fee (if you want us to approve your design plan);
- (d) The inspection fee; and
- (e) The insignia application and fee. (See WAC 296-150C-3000.)

(3) A design plan review is not required if the alteration can be made without altering any of the existing structure.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0240, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0250 How do I replace lost or damaged insignia? (1) If an insignia is lost or damaged after it is placed on a commercial coach, you may obtain a replacement insignia.

(2) You should contact us and provide the following information:

- (a) Your name, address, and telephone number;
- (b) The name of the manufacturer or person converting the vendor unit;
- (c) The serial number;
- (d) The manufacturer number (CC#) if available;
- (e) The insignia number if available; and
- (f) The required fee. (See WAC 296-150C-3000.)

(3) If we can determine that your unit previously had an insignia, we will:

- (a) Perform an inspection to ensure that no unauthorized remodeling has occurred;

Note: If unauthorized remodeling has occurred see WAC 296-150C-0200;

(b) Attach an insignia to your unit once we receive your insignia fee. (See WAC 296-150C-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0250, filed 10/23/96, effective 11/25/96.]

DESIGN PLAN

WAC 296-150C-0300 When is design-plan approval required? Design plans for commercial coaches are required

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for units that are sold, leased, or used in Washington state and must be approved when:

- (1) You build a new unit;
- (2) You modify an approved design plan through addendums;
- (3) You add options to an approved design plan through addendums; or
- (4) You change the occupancy classification of the building.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0300, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0310 Who can approve design plans? (1) Design plans can be approved by us or by a licensed professional or firm authorized by us. (See WAC 296-150C-0420 and 296-150C-0430.)

(2) All electrical design plans for new or altered electrical installations for educational institutions, health care facilities, and other buildings required by chapter 296-46 WAC, Safety standards—Installing electric wires and equipment—Administrative rules, must be reviewed and approved by us.

(3) A professional cannot approve plans submitted under a reciprocal agreement.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-0310, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0310, filed 10/23/96, effective 11/25/96.]

DESIGN-PLAN APPROVAL BY THE DEPARTMENT

WAC 296-150C-0320 What must I provide with my request for commercial coach design-plan approval by the department? All requests for design-plan approval must include:

- (1) A completed design-plan approval request form;
- (2) Two sets of design plans plus elevation drawings, specifications, engineering analysis, and test results and procedures necessary for a complete evaluation of the design; (See WAC 296-150C-0340 and 296-150C-0350.)

(3) At least one set of design plans must have an original wet stamp from a professional engineer or architect licensed in Washington state. We will retain the set with the original wet stamp;

(4) Receipt of a one-time initial design plan filing fee and the initial design plan fee (see WAC 296-150C-3000);

(5) A "key drawing" to show the arrangement of modules if the plan covers three or more modules;

(6) The occupancy class of the commercial coach according to the occupancy classifications in The Uniform Building Code;

(7) All plans required by WAC 296-46-140 (Plan review for educational, institutional or health care facilities and other buildings) must be reviewed by the department. The department's fee for this plan review is listed in the fee table in WAC 296-150C-3000, Commercial coach fees.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-0320, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0320, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0330 What must I provide with my request for a commercial coach vendor unit design-plan approval by the department? All requests for design-plan approval must include:

- (1) A completed design-plan approval request form;
- (2) Two sets of design plans, engineering analysis, or test results and procedures for a complete evaluation of the design plan; (See WAC 296-150C-0340 and 296-150C-0350.)
- (3) An original wet stamp from a professional engineer or architect licensed in Washington state, if an engineering analysis is used to substantiate the structural requirements instead of test results; and
- (4) Receipt of the design plan fee. (See WAC 296-150C-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0330, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0340 What must an engineering analysis for design plans include? (1) The engineering analysis must show that the structural design meets the requirements of this chapter.

(2) An engineering analysis must be conducted according to accepted engineering practices and must be signed by a professional engineer or architect licensed in Washington. (See WAC 296-150C-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0340, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0350 What must test procedures and results for design plans include? (1) Tests to a design must be witnessed by a professional engineer or architect licensed in Washington or by a departmental employee.

- (2) Test reports must contain the following items:
 - (a) A description of the methods or standards that applied to the test;
 - (b) Drawings and a description of the item tested;
 - (c) A description of the test set-up;
 - (d) The procedure used to verify the correct load;
 - (e) The procedure used to measure each condition;
 - (f) Test data, including applicable graphs and observations of the characteristics and behavior of the item tested; and
 - (g) Analysis, comments, and conclusion.
- (3) The written test procedures and conclusions must reference the applicable design plan.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0350, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0380 What happens if you approve my design plan? (1) Your design plan will be approved if it meets the requirements of this chapter.

(2) We will send you an approved copy of the design plan with the design-plan approval number.

(3) You must keep copies of the approved design plan available for inspection at each location where the commercial coach is built.

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(4) If your design plan is not approved, you will be notified in writing of plan deficiencies. You may send a corrected design plan to us. (See WAC 296-150C-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0380, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0390 If my design plan is not approved, how much time do I have to submit a corrected design plan? (1) You have ninety days to correct and resubmit your original design plan and send us the resubmittal fee after we notify you of plan deficiencies. After ninety days, your initial design plan is returned to you.

(2) If you submit your corrected design plan after ninety days, the initial design plan fee is required instead of the resubmittal fee. (See WAC 296-150C-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0390, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0400 What happens after my design plan is approved? Once your design plan is approved, we will inspect each commercial coach.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0400, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0410 When does my design plan expire? *Commercial Coach - Master Design Plan:*

(1) Your commercial coach master design plan expires when there is a code change. You must submit new design plans for approval when there is a state building code cycle change. You may use your approved master design plans to order insignia as long as they comply with the applicable codes.

Commercial Coach - One-Year Design Plan:

(2) Your commercial coach one-year design plan expires either one year after approval or when there is a code change. You must submit new design plans for approval when there is a state building code cycle change. You may use your design plans to order insignia as long as they comply with the applicable codes.

(3) All National Electrical Code amendments may be incorporated by an addendum to your design plan.

Note: The State Building Code is on a three-year code cycle which coincides with the State Building Code Council amendment cycle. The National Electrical Code (NEC) cycle, however, does not coincide with the other code cycles.

Commercial Coach Vendor Unit:

(4) Your vendor unit design plan expires after the unit is converted or altered. You can only use this design plan once.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-0410, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0410, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0415 Who approves addendums to design plans approved by the department? You must have us approve an addendum to a design plan, if we initially approved your design plan.

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[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0415, filed 10/23/96, effective 11/25/96.]

DESIGN-PLAN APPROVAL BY A LICENSED PROFESSIONAL OR FIRM

WAC 296-150C-0420 Who can be authorized to approve design plans? (1) A professional engineer, architect or firm licensed by the state of Washington according to the Engineers Registration Act, chapter 18.43 RCW and/or the Architects Registration Act, chapter 18.08 RCW; or

(2) A professional engineer, architect or firm licensed in another state that has licensing or certification requirements that meet or exceed Washington requirements.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0420, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0430 What information must a professional or firm provide to be authorized to approve design plans? (1) Name, a copy of your certificate of registration, and address of the professional engineer or architect; or

(2) Name, a copy of your certificate of authority, and address of the firm; and

(3) A description of the services the professional engineer, architect, or firm will provide; and

(4) A description of the professional's area(s) of expertise and qualifications which include:

(a) A summary of the professional's or firm's experience; and

(b) Verification of experience in your area of expertise such as structural, mechanical, plumbing, energy, electrical, fire and life safety, and ventilation and indoor air quality.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0430, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0440 How will I know whether I am authorized to approve design plans? Within sixty days after you submit the information requested in WAC 296-150C-0430, we will send you a letter either approving or denying your authorization request.

(1) If we approve your request, your name is added to the list of licensed professionals and firms authorized to approve design plans.

(a) We will authorize a professional to approve portions of a design plan within his or her area of expertise; and

(b) We will authorize an engineering or architectural firm to approve plans if the firm employs or contracts with professionals within the area of expertise necessary for the design plan.

(2) If we do not approve your request, we will notify you in writing why we are denying your request for authorization. If you disagree with our decision, you can send us a written request for a hearing, stating why you disagree. (See WAC 296-150C-0100.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0440, filed 10/23/96, effective 11/25/96.]

[Title 296 WAC—p. 2010]

WAC 296-150C-0450 How long is a licensed professional or firms authorization effective? Your authorization to approve design plans is effective until your license expires, is revoked or is suspended.

(1) You must notify us of your license renewal at least fifteen days before your license expires, to prevent your name from being removed from our licensed professional and firm list.

(2) You must notify us immediately if your license is revoked or suspended. Your name is then removed from the list of licensed professionals and firms authorized to approve design plans.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0450, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0460 What information must a manufacturer provide when a professional or firm does the design-plan approval? You must provide the following information with your approved design plans:

(1) A completed departmental design-plan approval request form;

(2) Two or more sets of design plans plus elevation drawings, specifications, engineering analysis, and test results and procedures necessary for a complete evaluation of the design. These design plans must have an original wet stamp, be signed, and dated by the approving professional(s) (see WAC 296-150C-0340 and 296-150C-0350);

(3) A cover sheet on the design plan noting which professional approved each portion of the design plan;

(4) A copy of the authorization letter from us;

(5) The design plan fee for design plans approved by professionals or firms; (see WAC 296-150C-3000.)

(6) A professional who designs and certifies that the commercial coach design meets state requirements cannot also approve the design plan in the plan approval process;

(7) A professional cannot approve those electrical designs listed in WAC 296-150C-0310(2); and

(8) A professional cannot approve plans submitted under a reciprocal agreement.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-0460, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0460, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0470 What happens after we receive the professional or firm approved design plan and information? (1) After we receive your approved design plans and information, we will review the information and assign a plan approval number. We will send a copy of the design plan with the plan approval number to the manufacturer.

(2) We may periodically audit design plans approved by a professional engineer, architect, or firm to ensure compliance with design plan requirements. The department's periodic audit should not be construed as certifying that the plans are safe.

(3) If the audit reveals that the design plans approved by the professionals and firms do not comply with this chapter, you will be notified and required to pay our fees for review and approval of the design plans. (See WAC 296-150C-3000.)

(1999 Ed.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0470, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0480 Do you have a list of professionals or firms that are authorized to approve design plans? We will maintain a list of the licensed professionals and firms that are authorized to approve design plans for commercial coaches.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0480, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0490 Who approves addendums to design plans approved by a professional or firm? (1) You must have the professional or firm approve an addendum to a design plan, if they initially approved your design plan.

(2) If the professional or firm who approved your design plan is no longer on the department list you may have us approve your addendum.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0490, filed 10/23/96, effective 11/25/96.]

INSPECTIONS PRIOR TO ISSUANCE OF AN INSIGNIA

WAC 296-150C-0500 When is an inspection required? (1) Before we issue an insignia, each unit manufactured or converted must be inspected as many times as required to show compliance with this chapter.

Note: Each commercial coach must have a serial number so we can track inspections.

(2) Before we issue an insignia, each commercial coach must be inspected at the manufacturing location as many times as required. Inspections may include but are not limited to:

(a) A "cover" inspection during construction of the unit before the electrical, plumbing, mechanical, and structural systems are covered;

(b) Insulation and vapor barrier inspection, if required; and

(c) A final inspection after the commercial coach is complete.

(3) If we discover a violation during inspection, we will issue a notice of noncompliance. You can correct the violation during the inspection. If you cannot correct the violation during inspection, you must leave the item uncovered until we approve your correction.

(4) If a commercial coach is damaged in transit to the building site or during on-site installation, it must be inspected. This is considered an alteration inspection. (See WAC 296-150C-0240.)

(5) Approved design plans must be available in compliance with the applicable sections of the adopted state codes.

(6) Once your unit is inspected and approved we will attach the insignia.

Commercial Coach Vendor Unit

(7) Before we issue an insignia, each commercial coach vendor unit is inspected as follows:

(a) Inspection(s) during conversion or alteration of a commercial coach vendor unit; and

(b) A final inspection after the commercial coach vendor unit is complete.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-0500, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0500, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0510 How do I request an inspection? (1) You must contact us, and we will let you know where your request for inspection should be submitted. Our address is noted in the definition of department.

(2) We must receive in-state inspection requests at least seven calendar days prior to the date that you want the inspection.

(3) We must receive out-of-state inspection requests at least fourteen calendar days prior to the date that you want the inspection.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0510, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0520 What happens if my commercial coach passes inspection? If your commercial coach passes inspection and you have met the other requirements of this chapter, we will attach the insignia.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0520, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0530 Am I charged if I request an inspection but I am not prepared? (1) If you ask us to inspect a commercial coach within Washington state but you are not prepared when we arrive, you must pay the inspection fee and travel. (See WAC 296-150C-3000.)

(2) If you ask us to inspect a commercial coach outside Washington state but you are not prepared when we arrive, you must pay the inspection fee, travel, and per diem expenses. (See WAC 296-150C-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0530, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0540 Who inspects commercial coach installation at the building site? The local enforcement agency (city or county) must approve the installation.

Note: The local enforcement agency may not open the concealed construction of a commercial coach to inspect it if our insignia is attached.

Note: Alterations to commercial coaches must be inspected and approved by us.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0540, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0550 Do you allow a commercial coach to be completed at the installation site? Commercial coaches must be completed at the manufacturing location before an insignia is attached.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0550, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0560 What happens if I receive a notice of noncompliance after inspection of the alteration to my commercial coach? (1) If your commercial coach alteration does not pass our inspection, you will receive a notice of noncompliance. The notice of noncompliance explains what items must be corrected.

(2) You have twenty days after receiving the notice of noncompliance to send us a written response to explain how you will correct the violations.

(3) You are not allowed to sell, lease, offer for sale or use the altered commercial coach until you correct the violations. We must inspect and approve the corrections, and you must pay the inspection and insignia fees, if required (see WAC 296-150C-3000).

[Statutory Authority: Chapter 43.22 RCW, 98-14-078, § 296-150C-0560, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0560, filed 10/23/96, effective 11/25/96.]

USED COMMERCIAL COACHES WITHOUT AN INSIGNIA

WAC 296-150C-0580 Must I obtain an insignia for used commercial coaches? All used commercial coaches that are to be installed on a building site or used in Washington state must have an insignia of approval from us. (See exceptions WAC 296-150C-0200 (1)(a)(b).)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0580, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0590 How do I obtain insignia for used commercial coaches? We consider used commercial coaches as new units for purposes of insignia approval. To obtain insignia, you must:

(1) Have the design plan approved (see WAC 296-150C-0300 through 296-150C-0480);

(2) Purchase insignia (see WAC 296-150C-0200 through 296-150C-0230); and

(3) Pass a unit inspection (see WAC 296-150C-0500 through 296-150C-0560).

Note: You will be required to open up as much of the construction of the unit as is necessary for inspection to show compliance with your approved design plan.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0590, filed 10/23/96, effective 11/25/96.]

MANUFACTURER'S NOTICE TO THE DEPARTMENT

WAC 296-150C-0700 Must manufacturers of commercial coaches notify you if they manufacture at more than one location? (1) If you are manufacturing commercial coaches at more than one location, approved design plans must be available at each manufacturing location.

(2) You must send us the following information for each manufacturing location:

(a) Company name;

(b) Mailing and physical address; and

(c) Phone and FAX number if available.

(3) You must update this information as it changes.

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[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0700, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0710 Must manufacturers of commercial coaches notify you of a change in business name or address? (1) If you are moving you must notify us in writing prior to a change of business name or address.

(2) Your notice must include the change of name and address.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0710, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0720 Must manufacturers of commercial coaches notify you of a change in business ownership? (1) When a manufacturer changes ownership, the new owner must notify us in writing immediately.

(2) A new owner may continue to manufacture the units according to a prior approved design plan if the prior owner provides written releases of the design plan.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0720, filed 10/23/96, effective 11/25/96.]

COMMERCIAL COACH CONSTRUCTION CODE

GENERAL

WAC 296-150C-0800 What manufacturing codes apply to commercial coaches? (1) All design, construction, and installations of commercial coaches must conform with the following codes and the requirements of this chapter:

(a) The latest adopted version of the Washington State Ventilation and Indoor Air Quality Code, as adopted by chapter 51-13 WAC;

(b) The structural and other requirements of this chapter;

(c) Occupancy classification only from chapter 3 of The Uniform Building Code, 1997 edition as adopted and amended by chapter 51-40 WAC, except commercial coaches must not be group H or R-3 occupancy;

(d) Accessibility requirements of chapter 11 of The Uniform Building Code, 1997 edition as adopted and amended by chapter 51-40 WAC;

(e) Table 16-A Uniform and concentrated floor loads and footnotes of The Uniform Building Code, 1997 edition as adopted and amended by chapter 51-40 WAC;

(f) The Uniform Mechanical Code, 1997 edition as adopted and amended by chapter 51-42 WAC except when conflicting with the provisions of this chapter, this chapter controls;

(g) The National Electrical Code as referenced in chapter 19.28 RCW and chapter 296-46 WAC;

(h) The latest adopted version of the Washington State Energy Code, as adopted by chapter 51-11 WAC;

(i) The Uniform Plumbing Code, 1997 edition as adopted and amended by chapters 51-46 and 51-47 WAC;

(j) Where there is a conflict between codes, an earlier named code takes precedent over a later named code. Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive governs. Where there is a conflict

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between a general requirement and a special requirement, the specific requirement must be applicable.

(2) All construction methods and installations must use accepted engineering practices, provide minimum health and safety to the occupants of commercial coaches and the public, and demonstrate journeyman quality of work of the various trades.

(3) Requirements for any size, weight, or quality of material modified by the terms "minimum," "not less than," "at least," and similar expressions are minimum standards. The manufacturer may exceed these rules provided the deviation does not result in inferior installation or defeat the purpose and intent of this chapter.

Note: The codes, RCW's and WAC's referenced in this rule are available to view at the Washington State Library, the Washington State Law Library, and may also be available at your local library.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-0800, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0800, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0810 Construction definitions. The following definitions and the definitions in each of the state codes adopted in WAC 296-150C-0800 apply to commercial coach construction.

"Anchoring system" is the means used to secure a commercial coach to ground anchors or to other approved fastening devices. It may include straps, cables, turnbuckles, bolts, fasteners, or other components.

"Ceiling height" is the clear vertical distance from the finished floor to the finished ceiling.

"Dead load" is the vertical load resulting from the weight of all permanent structural and nonstructural parts of a commercial coach including walls, floors, roof, partitions, and fixed service equipment.

"Diagonal tie" is a tie intended primarily to resist horizontal or shear forces and secondarily may resist vertical, uplift, and overturning forces.

"Dormitory" is a room designed to be occupied by more than two persons.

"Exit" is a continuous and unobstructed means of egress to a public way.

"Glazed opening" is a glazed skylight or an exterior window or glazing of a door of a commercial coach.

"Gross floor area" is the net floor area within the enclosing walls of a room where the ceiling is at least five feet high.

"Habitable room" is a room or enclosed floor space arranged for living, eating, food preparation, or dormitory sleeping purposes. It does not include bathrooms, toilet compartments, foyers, hallways, or other accessory floor spaces. Any reference to "habitable dwelling" in this chapter means a temporary structure not used as a single family dwelling.

"Interior finish" is the surface material of walls, fixed or movable partitions, ceilings and other exposed interior surfaces affixed to the commercial coach structure, including paint and wallpaper. Decorations or furnishings attached to the commercial coach structure are considered part of the interior finish.

(1999 Ed.)

"Live load" is the weight superimposed by the use and occupancy of the commercial coach, including wind load and snow load, but not including dead load.

"Perimeter blocking" is support placed under exterior walls.

"Shear wall" is a wall designed and constructed to transfer lateral loads.

"Tiedown" is a device designed to anchor a commercial coach to ground anchors.

"Use" or "occupancy classification" is the designed purpose of a commercial coach according to The Uniform Building Code.

"Wind load" is the lateral or vertical pressure or uplift created by wind blowing in any direction.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0810, filed 10/23/96, effective 11/25/96.]

STRUCTURAL

WAC 296-150C-0820 What are the basic structural requirements of a commercial coach? Each commercial coach must be designed and constructed as a completely integrated structure capable of sustaining the design-load requirements of this chapter. It shall be capable of:

(1) Transmitting these loads to stabilizing devices without causing unsafe deformation or abnormal structural movement; and

(2) Withstanding the adverse effects of transportation shock and vibration as an integrated structure.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-0820, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0820, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0830 Fastening of structural systems. Roof framing must be securely fastened to wall framing, walls to floor structure, and floor structure to chassis. This must secure and maintain continuity between the floor and chassis and resist wind uplift, overturning, and sliding as imposed by design loads.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0830, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0840 Live loads. (1) The design live loads must be established according to this chapter and must be considered to be uniformly distributed.

(2) The roof live load must not be considered as acting simultaneously with the wind load. The roof and the floor live loads must not be considered as resisting the overturning moment due to wind. The roof live load and the floor live load must be considered to act both simultaneously and separately in order to determine the critical design loading for stresses and deflections.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0840, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0850 Roof loads. All roofs must be designed to sustain loads as follows:

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(1) Dead loads plus a minimum unit live load of 30 lb/ft² (2 months load duration); and

(2) A vertical net uplift load of 9 lb/ft² (1 day load duration).

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0850, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0860 Snow loads. The roof of a commercial coach must be designed for the loads to which it will be subjected in areas where snow records or experience indicate snow loads in excess of 30 lb/ft².

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0860, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0870 Standard wind loads. The commercial coach and each wind resisting part must be designed for the following wind loads:

Horizontal	15 lb/ft ²	(1 day load duration)
Vertical upward	9 lb/ft ²	(1 day load duration)
Vertical downward	(see WAC 296-150C-0850 Roof loads)	

A commercial coach must be designed for higher wind loads if area records or experience indicate that it will be subjected to wind loads in excess of the above loads if required by the local jurisdiction.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0870, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0880 Windstorm protection—Provisions for support and anchoring. (1) Each commercial coach must have provisions for support and anchoring systems that, when properly designed and installed, will resist overturning and lateral movement of the commercial coach as imposed by the respective design loads. Support and anchoring systems can be installed according to the Table in WAC 296-150C-1210 or designed by a professional engineer.

(2) The manufacturer of each commercial coach is required to make provision for the support and anchoring systems but is not required to provide the anchoring equipment or stabilizing devices.

(3) The manufacturer must provide printed instructions with each commercial coach specifying the location and required capacity of stabilizing devices on which the design is based.

Single-Wide Commercial Coaches:

(4) The provisions made for anchoring systems must be based on the following design criteria for single-wide commercial coaches:

(a) The minimum number of ties required per side is noted in WAC 296-150C-1210.

(b) Ties must be as evenly spaced as practicable along the length of the commercial coach. No more than eight feet open-end spacing must occur on each end.

(c) If continuous straps are provided as vertical ties, they must be positioned at rafters and studs. If a vertical tie and diagonal tie are located at the same place, both ties may be

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connected to a single ground anchor, as long as, the anchor used is capable of carrying both loads.

(d) Add-on sections of expandable commercial coaches must have provisions for vertical ties at the exposed ends.

Double-Wide Commercial Coaches:

(5) Double-wide commercial coaches require only diagonal ties specified in the table in WAC 296-150C-1210. The ties must be placed along the outer side walls.

(6) Protection must be provided at sharp corners where the anchoring system requires the use of external cables or straps. Protection must also be provided to minimize damage to roofing or siding by the cable or strap.

(7) Anchoring equipment must be capable of resisting an allowable working load equal to or exceeding 3,150 pounds and must be capable of withstanding a 50 percent overload (4,725 pounds total) without failure of either the anchoring equipment or the attachment point on the commercial coach.

(8) Exposed anchoring equipment must have a resistance to weather deterioration at least equal to that provided by a coating of zinc on steel of at least 0.30 ounces per square foot of surface coated.

(a) Slit or cut edges of zinc-coated steel strapping do not need to be zinc-coated.

(b) Type 1, Class B, Grade 1 steel strapping, 1 1/4 inches wide and 0.035 inch thick, conforming with Federal Specification QQ-S-781-G, meets the requirements of this paragraph.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0880, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0900 Interior walls and partitions. Interior walls and partitions must be:

(1) Constructed with structural capacity adequate for the intended purpose; and

(2) Capable of resisting a horizontal load of at least five pounds per square foot without exceeding the deflections specified in WAC 296-150C-0920.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0900, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0910 Minimum uniform and concentrated live loads. See use or occupancy of the 1994 edition of The Uniform Building Code for group occupancy loads.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0910, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0920 Design load deflection. When a structural assembly is subjected to total design live loads, the deflection for structural framing members must not exceed the following:

L = The clear span between supports or two times the length of a cantilever.

Floor	L/240
Roof and ceiling	L/180
Headers, beams, girders	L/180
Walls and partitions	L/180

(1999 Ed.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0920, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0930 Structural load tests. (1) A structural assembly or subassembly tested for qualification must sustain the design dead load plus the superimposed design live loads (see WAC 296-150C-0840) equal to 1.75 times the required live loads for a period of twelve hours without failure of the assembly or subassembly, unless otherwise specified in this chapter.

(2) An assembly or subassembly failure is defined as a rupture, fracture, or residual deflection which is greater than the limits set in WAC 296-150C-0920. The type and quality of material used in each test assembly or subassembly must be identified. The assembly or subassembly tested must represent the minimum quality of material.

(3)(a) Nationally recognized standards or engineering practices must be used for structural load tests for commercial coaches.

(b) Tests must be witnessed by a professional engineer or architect.

Note: We will provide test procedure forms upon request.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0930, filed 10/23/96, effective 11/25/96.]

CONSTRUCTION

WAC 296-150C-0940 Fastening of structural systems. Roof framing must be securely fastened to wall framing, walls to floor structure, and floor structure to chassis to secure and maintain continuity between the floor and chassis and to resist wind uplift, overturning, and sliding as imposed by design loads.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0940, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0950 Roof coverings/membrane/weather resistant. (1)(a) The roof covering must be securely fastened in an approved manner to the supporting roof construction and must provide weather protection for the commercial coach and the occupants. The roof covering must be installed according to the manufacturer's instructions and approved by us.

(b) Roofing membranes must be rigid enough to prevent deflection that would permit ponding of water or separation of seams due to snow or wind or during assembly or transportation.

(2) Exterior covering materials, including metal coverings, must be moisture and weather-resistant and contain corrosion resistant fasteners to prevent wind and rain deterioration.

Note: Electro-plated, electro-deposited zinc, and electro-galvanized staples are not considered corrosion resistant materials.

(3) All exterior openings or penetrations into the commercial coach around piping, ducts, plenums, or vents must be sealed with moisture resistant material.

(1999 Ed.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0950, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0960 What requirements apply to commercial coach roof trusses? (1) The construction of roof trusses must be approved by a professional engineer. Roof trusses may be produced by one of the following methods:

(a) Use of graded materials when an approved testing agency certifies truss construction and load requirements are met; the testing agency must prepare an approved quality control program which allows them to test the trusses with appropriate testing procedures.

(b) Use of nongraded materials, if each truss is tested in an approved testing jig at the manufacturer's site with a load equivalent to full design load (1.75 times the full design load sustained for twelve hours).

(2)(a) Representative trusses must be tested from the production line, when we request. The approved testing agency or engineer must submit the testing report to us.

(b) All test reports are to be stamped, signed, and dated by the approved testing agency or engineer who performs the test.

(c) These tests must not occur more than two times a year per design unless there are problems with the roof trusses.

(d) The manufacturer is required to maintain an acceptable quality level not exceeding 1% using acceptable sampling procedures.

Note: The acceptable quality level is defined as the maximum allowable percentage of defective units.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-0960, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0960, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0970 Roof construction. (1) All roofs must be framed and tied into the framework and supporting walls to form an integral part of the commercial coach.

(2) All trusses must be laterally braced.

(3) All roof decks must be designed and built with sufficient slope or camber to assure adequate drainage, or must be designed to support maximum loads including possible ponding of water due to deflection.

(4) Cutting roof framework members for passage of electrical, plumbing, or mechanical systems is prohibited except where substantiated by engineering analysis.

(5) Electrical, plumbing, or mechanical systems must not penetrate the roofing membrane unless the penetration point is adequately sealed.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0970, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-0990 Sealing wall exterior openings. All exterior wall openings or penetrations into the commercial coach around piping, ducts, plenums, or vents must be sealed with moisture-resistant material.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-0990, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1000 Drilling or notching of wood wall structural members. (1) **Cutting and notching.** In exterior walls and bearing partitions, any wood stud may be cut or notched to a depth not exceeding 25 percent of its width. Cutting or notching of studs to a depth not greater than 40 percent of the width of the stud is permitted in nonbearing partitions supporting no loads other than the weight of the partition.

(2) **Bored holes.** A hole not greater in diameter than 40 percent of the stud width may be bored in any wood stud. Bored holes not greater than 60 percent of the width of the stud are permitted in nonbearing partitions or in any wall where each bored stud is doubled, provided not more than two such successive doubled studs are so bored.

In no case shall the edge of the bored hole be nearer than 5/8 inch (16mm) to the edge of the stud. Bored holes shall not be located at the same section of stud as a cut or notch.

(3) Drilling or notching of studs greater than allowed in subsection (1) or (2) of this section must be substantiated by engineering analysis.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1000, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1020 Wall construction. Walls must be of sufficient strength to withstand the load requirements of this chapter. The connections between the bearing walls, floor, and roof framework members must be fabricated to provide support for the material used to enclose the commercial coach and to provide for the transfer of all lateral and vertical loads to the floor and the chassis.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1020, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1030 Fire-blocking. (1) Fire-blocking must be provided in commercial coaches to cut off all concealed draft openings in all stud walls and partitions, including furred spaces at the ceiling and floor levels and at ten foot intervals both vertical and horizontal.

(2) Fire-blocking must be provided around vents, pipes, ducts, chimneys, fireplaces, and similar openings which afford a passage for fire at ceiling and floor levels, with non-combustible material.

(3) Fire blocking must be two inch nominal lumber, gypsum board, cement asbestos board, mineral fiber or other approved materials securely fastened in place.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1030, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1040 Floors. (1) Wood floors or sub-floors in kitchens, bathrooms (including toilet compartments), laundry rooms, water heater compartments, and any other areas subject to excessive moisture must be moisture resistant; or they must be made moisture resistant by sealing or by an overlay of nonabsorbent material applied with water-resistant adhesive.

(2) Carpeting cannot be used under a heat producing appliance unless the appliance is listed for such use.

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[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1040, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1050 Drilling or notching of wood joist structural members. (1) Notches on the ends of joists must not exceed one-fourth the joist depth, unless substantiated by engineering design or approved tests.

(2) Holes bored in joists must not be within two inches of the top or bottom of the joist, and the diameter of any such hole must not exceed one-third of the depth of the joist.

(3) Notches in the top or bottom of the joists must not exceed one-sixth the depth and must not be located in the middle third of the span.

(4) Joists in transverse floor framing systems, which do not have perimeter blocking, must not be drilled or notched, unless substantiated by engineering design or approved tests.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1050, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1060 Fastening of structural systems. Roof framing must be securely fastened to wall framing, walls to floor structure, and floor structure to chassis to secure and maintain continuity between these elements to resist wind uplift, overturning and sliding imposed by the design loads.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1060, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1070 Floor closure material. Floor closure material around piping, ducts, plenums, or vents must prevent damage to the underside of the commercial coach due to air, water, insects, dust, and must be rodent resistant.

The closure material must meet ASTM D-781 standard or equal and be installed as follows:

(1) Fibrous material (with or without patches) must meet or exceed the level of 48 inch-pounds of puncture resistance as tested.

(2) The material must be installed according to installation instructions furnished by the supplier of the material.

(3) Patching material must be suitable for patches and the patch life must be equivalent to the material life.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1070, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1080 What design and construction requirements apply to a commercial coach chassis? Each commercial coach chassis must be designed and constructed to be capable of:

(1) Effectively sustaining the design loads consisting of the dead load plus five PSF load on the floor and the superimposed dynamic load resulting from highway movement, in no case shall the dynamic load be required to exceed twice the dead load; and

(2) Accepting the shock and vibration from the roadway and towing vehicle through the use of adequate running gear assemblies. Running gear assemblies consist of axles, springs, spring hangers, hubs, bearings, tires, rims and their

related hardware. Running gear assemblies must be capable of sustaining the loads in subsection (1) of this section.

(3) In the set up mode, the commercial coach must be designed to accommodate a fifty PSF floor load.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1080, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1080, filed 10/23/96, effective 11/25/96.]

MATERIALS

WAC 296-150C-1090 Standards for equipment and installations. The manufacturer's equipment and installation specifications must be followed. Other approved standards are acceptable when:

- Installed according to the manufacturer's installation instructions; and
- Approved by a listing or testing agency.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1090, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1100 Flame-spread limitations. (1)

The interior finish of all walls and partitions must have a flame-spread rating not exceeding two hundred except as otherwise specified in this section. The flame-spread limitation does not apply to:

(a) Molding, trim, windows, doors, or series of doors four feet wide or less;

(b) Permanently attached decorative items such as pictures or accent panels constituting a maximum of ten percent of the aggregate wall surface in any room or space or more than thirty-two square feet in surface area, whichever is less.

(2) All ceiling interior finish must have a maximum flame-spread rating of two hundred, excluding molding and trim two inches wide or less.

(3) Furnace and water heater spaces must be enclosed by walls, ceiling, and doors having an interior finish with a maximum flame-spread of twenty-five.

(4) Combustible kitchen cabinet doors, countertops, exposed bottom and end panels must have a maximum flame-spread of twenty-five. Cabinet rails, stiles, mullions, and toe strips are exempted.

(5) Exposed interior finishes adjacent to the cooking range must have a flame-spread of fifty. Adjacent surfaces are the exposed vertical surfaces between the range top and the overhead cabinets or ceiling and within six horizontal inches of the cooking range.

(6) Finish surfaces of plastic bath tubs, shower units and tub or shower doors must have a flame-spread of two hundred.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1100, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1110 Combustible limitations. (1)

The exposed wall adjacent to the cooking range, must be fifty flame-spread or less, such as 5/16 inch gypsum board or material having equivalent fire protective properties.

(2) All openings for pipes and vents in furnace and water heater spaces shall be tight-fitted or fire-stopped.

(1999 Ed.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1110, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1120 Kitchen cabinet protection. The bottom and sides of combustible kitchen cabinets over cooking ranges or tops including a space of six inches from the edge of the burners must be protected with at least materials rated at 25 or less flame-spread covered with at least twenty-six gauge sheet metal (.017 stainless steel, .024 aluminum or .020 copper) or equivalent protection. The protective metal over the range must form a hood with at least a three-inch eyebrow (measuring horizontally from face of cabinet). The hood must be centered over and at least as wide as the top of the cooking range.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1120, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1130 Insulation standards. Insulation standards for commercial coaches must comply with the Washington State Energy Code, unless another state law supersedes the Washington State Energy Code.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1130, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1140 Room sizes. (1) Every habitable room must have a minimum ceiling height of not less than seven feet.

(2) No habitable room, except a kitchen, must be less than five feet in any clear horizontal dimension.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1140, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1150 Hallways. (1) Hallways in structures required to meet accessibility standards must have a minimum horizontal dimension that conforms to accessibility standards set by the Washington state Uniform Building Code.

(2) Hallways in nonaccessible construction site trailers must have a minimum horizontal dimension of 32 inches.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1150, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1160 Accessibility standards. When applicable, a commercial coach must meet the accessibility standards set by the Washington State Building Code in RCW 19.27.030(5).

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1160, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1170 What are the lighting and ventilation requirements of a commercial coach? (1) Habitable rooms must be provided with exterior windows or doors having a total glazed area of at least ten percent of the floor area, or they must have artificial light.

(2) An area equal to a minimum of five percent of the floor area must be available for unobstructed ventilation. Glazed areas do not need to be opened if a mechanical venti-

lation system is provided. The mechanical ventilation system must be capable of producing a change of air in the room every thirty minutes with at least one-fifth of the air supply taken from outside the commercial coach.

(3) Each bathroom must be provided with artificial light and with external windows or a mechanical exhaust must be provided. The external window must have at least 1/2 square feet of glazed area fully able to open. A mechanical ventilation system must be capable of producing a change of air every twelve minutes. Any mechanical ventilation system must exhaust directly to the outside of the commercial coach.

[Statutory Authority: Chapter 43.22 RCW, 98-14-078, § 296-150C-1170, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1170, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1180 Commercial coach exits. When applicable, a commercial coach must comply with Uniform Building Code, Chapter 11 Accessibility and with the following requirements:

(1) Commercial coaches must have at least two exterior doors that are remote from each other. Remote means that in:

- (a) Single-wide units the doors may not be less than twenty feet apart; and
- (b) Multi-wide units the doors may not be less than twenty feet apart, center to center from each other measured in a straight line direction regardless of the length of travel between doors.

Exception: A commercial coach that is twenty-four feet long or less needs only one exit door, unless it has a dormitory sleeping area.

(2) Exterior doors must be constructed for exterior use. Exterior doors must provide at least a thirty-five inch wide by seventy-nine inch high clear opening (36" x 80" door). Each swinging exterior door must have a key-operated lock that has a deadlock latch. A deadlock with a passage set installed below the deadlock may be used as an acceptable alternate for each exterior door. The locking mechanism must be engaged or disengaged by the use of a lever or other device from the interior of the commercial coach. Locks must not require the use of a key for operation from the inside.

(3) Every room designed for dormitory sleeping, unless it has an exterior exit door, must have at least one window which can be opened from the inside without using tools. This window must provide a clear opening of at least twenty-two inches in its smallest dimension and five square feet in area with the bottom of the opening not more than three feet above the floor. If a screen or storm window is used it must be readily removable without using tools.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1180, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1190 Interior privacy. If a commercial coach interior door, such as a bathroom door, has a privacy lock, the lock must contain an emergency release. The emergency release must be on the outside to permit entry when the door is locked from the inside.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1190, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1195 Fire warning equipment—Automatic smoke detectors. (1) At least one smoke detector (which may be a single station smoke detector) must be installed in each commercial coach to protect each separate bedroom. Smoke detectors must meet the requirements of the Standard for Single and Multiple Station Smoke Detectors of the Underwriters Laboratories Inc. (UL 217). All dormitories must have at least one installed smoke detector.

(2) A smoke detector must be installed in the hallway or area next to the bedroom, and must be mounted, where possible, between the commercial area and the first bedroom door on an interior wall. Where mounting cannot be achieved due to limited interior wall space, the smoke detector must be located as close as practical to the first bedroom door on an interior wall. Commercial coaches having bedrooms separated by one or a combination of common use areas (such as a kitchen, dining area, or a commercial area, but, not a bathroom) must have at least two smoke detectors, one smoke detector protecting each bedroom.

(3) Smoke detectors must be installed per their listing. The smoke detector mounting must be attached to an electrical outlet box and the detector must be permanently wired into a general purpose electrical circuit. There must be no switches in the circuits to the detectors other than the circuit breaker serving the circuits.

(4) The commercial coach manufacturer must provide a copy of the testing and maintenance instructions supplied by the manufacturer of the smoke detector for the information of the consumer and users of the commercial coach.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1195, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1200 Installation instructions. The manufacturer must provide printed instructions upon request for each commercial coach specifying the following:

- (1) The location and required capacity of stabilizing devices, such as tie downs, piers, and blocking;
- (2) Devices and methods used to connect all components and systems including, chassis and utilities; and
- (3) Leveling, including releveling.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1200, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1210 Table: Number of ties required per side of commercial coach.

NUMBER OF TIES REQUIRED PER SIDE OF COMMERCIAL COACH

Note: This table is based on a minimum working load per anchor of three thousand one hundred fifty pounds with a fifty percent overload (four thousand seven hundred twenty-five pounds total).

Length of Commercial Coach (Feet)	No. of Vertical Ties	No. of Diagonal Ties
00-40	2	3
41-46	2	3
47-49	2	3

50-54	2	3
55-58	2	4
59-64	2	4
65-70	2	4

(1) Double-width commercial coaches require only the diagonal ties specified, and these must be placed along the outer side walls;

(2) Length of commercial coach (as used in this table) means length excluding draw bar;

(3) Diagonal ties in this method must deviate at least forty degrees from a vertical direction; or

(4) The number of ties required can be designed by a professional engineer.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1210, filed 10/23/96, effective 11/25/96.]

ELECTRICAL

WAC 296-150C-1220 Electrical—General. This chapter applies to the installation of electrical equipment in any commercial coach bearing or required to bear a department insignia.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1220, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1230 Electrical definitions. Definitions contained in the current adopted edition National Electrical Code (NEC), and the following definitions apply to the commercial coach electrical standards in this chapter.

"Converter" is a device that changes electrical energy from one form to another, as from alternating current to direct current.

"Feeder assembly" or "subpanel" is the overhead or under-chassis feeder conductor, including the grounding conductor, fittings, and equipment, or power-supply cord approved for commercial coach.

The feeder assembly or subpanel is used in commercial coaches and designed to deliver energy from the source of electrical supply to the distribution panelboard within the commercial coach.

"Low voltage" is an electromotive force rated at thirty-two volts or less, supplied from a transformer, converter, or battery.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1230, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1240 Branch circuit and feeder calculations. Branch circuit and feeder calculations must be determined according to the National Electrical Code.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1240, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1250 Disconnecting means and branch circuit protective equipment. (1) The branch circuit equipment may be combined with the disconnecting means as a single assembly. Such a combination may be designated as a distribution panelboard. If a fused distribution panel-

board is used, the maximum fuse size for the mains must be plainly marked with lettering at least 1/4 inch high and visible when fuses are changed.

Note: See the National Electrical Code concerning identification of each disconnecting means and each feeder or branch circuit at the point where it originated and type of marking needed.

(2) Plug fuses and fuseholders must be tamper-resistant, Type "S," enclosed in dead-front fuse panelboards.

(3) A single disconnecting means must be provided in each commercial coach. It must consist of a circuit breaker or a switch, fuses, and their accessories installed in a readily accessible location near the point of entrance of the supply cord or conductors into the commercial coach. The main circuit breakers or fuses must be plainly marked "main." This equipment must contain a solderless type of grounding connector or bar for the purposes of grounding, with sufficient terminals for all grounding conductors. The neutral bar termination of the grounded circuit conductors must be insulated.

(4) The disconnecting equipment must have a rating suitable for the connected load. The distribution equipment, either circuit breaker or fused type, must be located a minimum of twenty-four inches from the bottom of such equipment to the floor level of the commercial coach. There must be an accessible space of at least thirty inches wide by thirty-six inches deep by seventy-eight inches high in front of the electrical disconnect equipment. The main circuit breakers or switches must be plainly marked "main." There must be a label attached to the panelboard stating:

"This panelboard must be connected by a feeder assembly having overcurrent protection rated at not more than _____ amperes." (The correct ampere rating must be marked in the blank space.)

(5) Branch circuit distribution equipment must be installed in each commercial coach and must include overcurrent protection for each branch circuit consisting of either circuit breakers or fuses.

(6) The branch circuit overcurrent devices must be rated:

(a) Not more than the circuit conductors; and

(b) Not more than one hundred fifty percent of the rating of a single appliance rated ten amperes or more; but

(c) Not more than the overcurrent protection rating marked on the motor-operated appliance. A device not approved for branch circuit protection, such as a thermal cut-out or motor overload protective device, must not be considered as the overcurrent device protecting the circuit.

(7) A 20-ampere fuse or circuit breaker must be considered adequate protection for fixture leads, cords for portable appliances and No. 14 AWG (American Wire Gauge) tap conductors, not over six feet long, for recessed lighting fixtures.

(8) If more than one outlet or load is on a branch circuit, a 15-ampere receptacle must be considered protected by a 20-ampere fuse or circuit breaker.

(9) When circuit breakers are provided for branch circuit protection, 240-volt circuits must be protected by two-pole common or companion trip circuit breakers.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1250, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1260 Power supply—Feeder assembly equipment. A commercial coach must be provided with feeder assembly equipment, installed by the manufacturer according to National Electrical Code and the provisions of this chapter. The assembly must be either:

- (1) One overhead assembly containing the required number of insulated color-coded feeder conductors, one of which must be a grounding conductor; or
- (2) One under-vehicle assembly consisting of conduit running from the commercial coach branch circuit panelboard to the underside of the commercial coach. Conduit must be sized in accordance with the National Electrical Code; or
- (3) Other installations approved by the department.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1260, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1270 Identification of feeder assembly connection. (1) Each commercial coach equipped with a 120-volt electrical system must have a label, permanently attached on the outside wall adjacent to the point of entrance of the feeder assembly, that reads:

"THIS CONNECTION IS FOR 110-125 VOLT AC SERVICE. DO NOT CONNECT HIGHER VOLTAGE."

(2) Each commercial coach equipped with a 120/240-volt AC electrical system must have a label, permanently attached on the outside wall, adjacent to the point of entrance of the supply assembly or permanently installed feeders, that reads:

"THIS CONNECTION IS FOR 120/240 VOLT AC _____ AMPERE SERVICE." (The correct service rating shall be stamped in the blank space.)

(3) Each commercial coach equipped with a 480/277-volt electrical system must have a label, permanently attached on the outside wall, adjacent to the point of entrance of the supply assembly or permanently installed feeders, that reads:

"THIS CONNECTION IS FOR 480/277 VOLT AC _____ AMPERE SERVICE." (The correct service rating shall be stamped in the blank space.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1270, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1280 Wiring methods—Wiring of expandable or multiple units. (1) Where circuits in expandable or multiple units are designed to be energized from one main panelboard, permanent-type wiring methods and materials must be used for connecting the units to each other.

(2) Commercial coaches may have individual branch circuit panelboards installed in each unit subject to the requirements of this chapter.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1280, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1290 Under-chassis wiring. Outdoor or under-chassis wiring (120/240 volts) exposed to moisture and mechanical damage must be protected by rigid metal conduit, electrical metallic tubing, liquid-tight flexible metal

conduit, or nonmetallic conduit. The conductors shall be type RW, TW, or equivalent.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1290, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1300 Equipment mounting. Electrical equipment must be securely mounted to prevent displacement during transit. Meter bases must not be mounted on commercial coaches.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1300, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1303 How must storage batteries be installed in a commercial coach? Storage batteries subject to the provisions of this standard must be securely attached to the commercial coach. They must be installed in an area which is vapor-tight to the interior and ventilated directly to the exterior of the coach. When batteries are installed in a compartment, the compartment must be ventilated with openings of not less than two square inches at the top and two square inches at the bottom. Batteries must not be installed in a compartment containing spark or flame producing equipment, except in an engine generator compartment if the only charging source is the generator itself.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1303, filed 6/30/98, effective 7/31/98.]

WAC 296-150C-1310 Grounding—General. Grounding of both electrical and nonelectrical metal parts in a commercial coach must be through connection to a grounding bus in the commercial coach distribution panel. The grounding bus must be grounded through the green conductor in the supply cord. It may also be grounded through the feeder wiring to the service ground in the service-entrance equipment located adjacent to the commercial coach location. Do not connect either the frame of the commercial coach or the frame of any appliance to the neutral conductor in the commercial coach.

(1) The insulated neutral requirements are as follows:

(a) The grounded (neutral) circuit conductor must be insulated from the grounding conductors, from equipment enclosures, and from other grounded parts.

(b) The grounded (neutral) circuit terminals in the distribution panels and in ranges, clothes dryers, counter-mounted cooking units, and wall-mounted ovens must be insulated from the equipment enclosure.

(c) Bonding screws, straps, or buses in the distribution panel or in appliances *must be removed and discarded*.

(d) Connections of ranges and clothes dryers with 120/240 volt, 3-wire ratings must be made with 4-conductor cord and 3-pole, 4-wire grounding-type plugs or by type AC metalclad cable or individual conductors enclosed in flexible metal conduit.

(e) Type NM or type SE cable must not be used to connect a range or a dryer. This does not prohibit the use of type NM or type SE cable between the branch circuit overcurrent protective device and a junction box or range or dryer receptacle.

(f) For 120-volt rated devices, a 3-conductor cord and 2-pole, 3-wire grounding-type plug is permitted.

(2) The following equipment grounding means must be used:

(a) The green grounding wire in the supply cord or permanent feeder wiring must be connected to the grounding bus in the distribution panel or disconnecting means.

(b) In the electrical system, all exposed metal parts, enclosures, frames, lamp fixture canopies, etc., must be effectively bonded to the grounding terminal or enclosure of the distribution panel.

(c) Cord-connected appliances must be grounded by means of an approved cord with grounding conductor and grounding-type attachment plug.

(3) The following bonding requirements of noncurrent-carrying metal parts must apply:

(a) All exposed noncurrent-carrying metal parts that may become energized must be effectively bonded to the grounding terminal or enclosure of the distribution panelboard. A bonding conductor must be connected between each distribution panelboard and an accessible terminal on the chassis.

(b) Grounding terminals must be of the solderless type and approved as pressure-terminal connectors recognized for the wire size used.

(c) The bonding conductor must be solid or stranded, insulated or bare and must be No. 8 copper minimum or equal. It must be routed so as not to be exposed to physical damage.

(d) Metallic gas, water, and waste pipes and metallic air circulating ducts must be considered bonded if they are connected to the terminal on the chassis by clamps, solderless connectors or by suitable grounding-type straps.

(e) Any metallic roof and exterior covering must be considered bonded if:

(i) The metal panels overlap one another and are securely attached to the wood or metal frame parts by metallic fasteners;

(ii) The lower panel of the metallic exterior covering is secured at a cross member of the chassis by two metal fastener straps per commercial coach unit or section at opposite ends; and

(iii) The bonding strap must be a minimum of 30 gauge galvanized metal and must be a minimum of four inches wide.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1310, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1320 Dielectric strength test. (1)(a) The wiring of each commercial coach must be subjected to a one-minute, 900-volt, dielectric strength test between live parts (including neutral) and the commercial coach ground. All switches must be closed during the test. (Closed switches are in the on position.)

(b) The test may also be performed at 1,080 volts for one second. This test must be performed after branch circuits are complete and after fixtures or appliances are installed.

Exception: Fixtures and appliances are not required to withstand the dielectric strength test.

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(2) Each commercial coach designed with a 480-volt electrical system must be subjected to a one-minute 1,275-volt dielectric strength test between current-carrying conductors and the coach ground. The test may also be performed at 1,500 volts for one second.

(3) Low-voltage circuit conductors in each commercial coach must withstand the applied potential without electrical breakdown of a one-minute, 500-volt, or a one-second, 600-volt, dielectric strength test. The potential must be applied between live and grounded conductors.

(4) The test is to be performed by the manufacturer and witnessed by the inspector.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1320, filed 10/23/96, effective 11/25/96.]

MECHANICAL

WAC 296-150C-1330 Mechanical—General. This chapter applies to the installation of mechanical, ventilation, and indoor air quality equipment in any commercial coach bearing or required to bear a department insignia. Mechanical, ventilation, and indoor air quality equipment and installations in or on a commercial coach shall be installed according to the requirements of the Uniform Mechanical Code, the Washington State Ventilation and Indoor Air Quality Code, the rules of this chapter, and the conditions of the equipment approval or listing agency.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1330, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1340 Mechanical definitions. Definitions contained in the current adopted edition of the Uniform Mechanical Code, and the following definitions apply to the commercial coaches.

"**Accessible**" is having access to a fixture, connection, appliance, or equipment that requires the removal of an access panel, door, or similar obstruction.

"**Appliance compartment**" is a room having a floor area not in excess of twice the largest plan area of the room's appliance or appliances plus clearances required in this chapter.

"**Automatic pilot device**" is a device employed with gas-burning equipment that will either automatically shut off the gas supply to the burner being served or automatically activate, electrically or otherwise, a gas shut-off device when the pilot flame is extinguished.

"**Btuh**" is British thermal units per hour.

"**Clearance**" is the distance between the appliance, chimney, vent, or chimney or vent connector, or plenum and the nearest surface.

"**Combustible material**" is a material adjacent to or in contact with a heat-producing appliance, vent connector, chimney, or steam and hot water pipes, made of or surfaced with wood, compressed paper, plant fibers, or other products that will ignite and burn. Such material must be considered combustible even though flame-proofed, fire-retardant treated, or plastered.

"**Connector-gas appliance**" is a flexible or semi-rigid connector listed as conforming to ANSI Standard Z21.24,

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Metal Connectors for Gas Appliances, used to convey fuel gas, three feet or less in length (six feet or less for gas ranges), between a gas outlet and a gas appliance in the same room.

"**Fuel gas piping system**" is the arrangement of piping, tubing, fittings, connectors, valves, and devices designed and intended to supply or control the flow of fuel gas to an appliance.

"**Gas**" is fuel gas, such as natural gas, manufactured gas, undiluted liquefied petroleum gas (vapor phase only), liquefied petroleum air-gas mixtures, or mixtures of these gases that would ignite in the presence of oxygen.

"**Gas-supply connection**" is the terminal end or connection to which a gas-supply connector is attached.

"**Input rating**" is the maximum fuel-burning capacity of any warm-air furnace, recessed heater, or burner expressed in British thermal units per hour.

"**Liquefied petroleum gases (LPG)**" is any material that is composed predominantly of propane, propylene, butanes (normal butane or isobutane), and butylenes, or any mixture of them.

"**Quick-disconnect device**" is a hand-operated means of connecting and disconnecting a gas supply or connecting gas systems and is equipped with an automatic device to shut off the gas supply when disconnected.

"**Readily accessible**" is having direct access without the necessity of removing any panel, door, or similar obstruction.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1340, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1350 LPG system enclosure and mounting. (1) LPG containers must not be installed, nor stored temporarily, inside any commercial coach.

Exception: This prohibition does not apply to completely self-contained hand torches, lanterns, or similar equipment with containers having a maximum water capacity of two and one-half pounds (approximately one pound LPG capacity).

(2)(a) Containers, control valves and regulating equipment, when installed, must be mounted on the "A" frame of the commercial coach or installed in a compartment that is *vapor-tight* to the inside of the commercial coach and accessible only from the outside.

(b) The compartment must be ventilated at top and bottom to diffuse vapors. The compartment must be ventilated with two vents having an aggregate area of not less than two percent of the floor area of the compartment and must open without restriction to the outside. The required vents must be equally distributed between the floor and ceiling of the compartment. If the lower vent is located in the access door or wall, the bottom edge of the vent shall be flush with the floor level of the compartment. The top vent must be located in the access door or wall with the bottom of the vent not more than twelve inches below the ceiling level of the compartment. All vents must have an unrestricted discharge to the outside atmosphere. Access doors or panels of compartments must not be equipped with locks or require special tools or knowledge to open.

(3) Doors, hoods, domes, or portions of housings and enclosures required to be removed or opened for container replacement must incorporate means for clamping them

firmly in place and preventing them from working loose during transit. Provisions must be incorporated in the assembly to hold the containers firmly in position and prevent their movement during transit.

(4) LPG containers must be mounted on a substantial support or a base secured firmly to the commercial coach chassis. Neither the container nor its support can extend below the commercial coach frame.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1350, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1360 Gas piping—Piping design.

Commercial coaches requiring fuel gas for any purpose must be equipped with a gas piping system that is designed for LPG only or combination LPG and natural gas.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1360, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1370 Gas piping—Expandable or multiple commercial coaches. Where gas piping is to be installed in more than one portion of an expandable or multiple commercial coach, the design and construction must be as follows:

(1) There must be only one point of cross over, readily accessible from the exterior of the commercial coach.

(2) The connector between units must be a listed flexible gas connector approved for exterior use.

(3) A shut-off valve must be located on the supply side of the connection. Both a flexible gas connector that is approved for exterior use and a quick disconnect type of connector must be tested and approved to IAPMO TSC-9 standard or equal; and both must have a shut-off valve installed that is tested and approved to ANSI Z21.15 standard or equal.

(4) Protective caps or plugs must be permanently attached to the coach and used to seal the system when not in use.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1370, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1380 Concealed tubing. (1) Tubing must not be run inside walls, floors, partitions, or roofs.

(2) If tubing passes through walls, floors, partitions, roofs, or similar installations, the tubing must be protected by the use of weather resistant grommets that snugly fit both the tubing and the hole through which the tubing passes.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1380, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1390 Gas piping—Pipe-joint compound. (1) Screw joints must be made tight with pipe-joint compound that is insoluble in liquefied petroleum gas.

(2) Pipe-joint compound must be approved for the type of gas used. The pipe-joint compound must be applied to the male threads only.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1390, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1400 Gas piping—Hangers and supports. (1) All gas piping must be adequately supported by galvanized or equivalently protected metal straps or hangers at intervals of not more than four feet, except where adequate support and protection is provided by structural members.

(2) Gas pipe supply connections must be rigidly anchored to a structural member within six inches of the supply connections.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1400, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1410 Gas piping—Electrical ground.

(1) Gas piping must not be used for an electrical ground.

(2) The gas line must be bonded.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1410, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1420 Identification of gas supply connections. A label must be permanently attached on the outside of the exterior wall of the commercial coach adjacent to the gas supply connection which provides the following information:

(1) The type of system (i.e., liquid petroleum system or natural gas system or combination liquid petroleum and natural gas system);

(2) The appropriate Btuh input rating; and

(3) If excess ("or more") Btuh input is allowed.

For example: Natural Gas System

250,000 Btuh

Or More

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1420, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1430 Gas piping system openings.

All openings in the gas piping system must be closed gas-tight with threaded pipe plugs or pipe caps.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1430, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1440 Gas piping—Valves. (1) In addition to any valve on the appliance, a shut-off valve must be installed in the fuel piping outside of each gas appliance but inside the commercial coach structure and upstream of the union or connector. The shut-off valve must be located within six feet of a cooking appliance and within three feet of any other appliance. A shut-off valve may serve more than one appliance if located as required above.

(2) Shut-off valves used in connection with gas piping must be of a type designed for use with liquefied petroleum gas. Shut-off valves must be tested and approved to ANSI Z21.15 standard or equal.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1440, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1450 Gas piping—Testing for leakage before appliances are connected. (1) The piping system must stand a pressure of at least ten psi gauge for a period of

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not less than fifteen minutes without showing any drop in pressure.

(2) Pressure must be measured with a gauge calibrated to be read in increments of not greater than one-tenth pound.

(3) The source of pressure must be isolated before the pressure tests are made. Before a test is begun, the temperature of the ambient air and of the piping must be approximately the same, and constant air temperature must be maintained throughout the test.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1450, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1460 Gas piping—Testing for leakage after appliances are connected. (1) After gas appliances have been connected, the gas-piping system must be subjected to a pressure test with the burner valves closed. The test consists of air at not less than ten inches nor more than fourteen inches pressure of water column (six to eight ounces). The system must hold this pressure for a period of not less than ten minutes with no leakage. Before beginning the test, the temperature of the gas-piping system and the test air must be equalized, and this shall be maintained throughout the test.

(2) Appliance shut-off valves ahead of gas cooking appliances may be closed for the performance of this test. When the test is satisfactorily performed, these valves must be opened and, while the system is under pressure, the appliance connectors must be tested with an approved leak detector or approved bubble solution.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1460, filed 10/23/96, effective 11/25/96.]

VENTILATION AND INDOOR AIR QUALITY

WAC 296-150C-1470 Ventilation and indoor air quality—General. Ventilation and indoor air quality equipment and installations in or on a commercial coach must be made according to the requirements of the Washington State Ventilation and Indoor Air Quality Code, the Uniform Mechanical Code, the rules of this chapter, and the conditions of the equipment approval.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1470, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1480 Ventilation and indoor air quality definitions. Definitions contained in the current adopted edition of the Washington State Ventilation and Indoor Air Quality Code and the Uniform Mechanical Code and the following definitions apply to the commercial coach ventilation and indoor air quality rules in this chapter.

"Duct" is a conduit or passageway for conveying air to or from heating, cooling, air conditioning, or ventilation equipment, not including the plenum.

"Plenum" is an air compartment that is part of an air-distributing system to which one or more ducts are connected.

- A **furnace-supply plenum** is a plenum attached directly to, or an integral part of, the air-supply outlet of the furnace.
- A **furnace-return plenum** is a plenum attached directly to, or an integral part of, the return inlet of the furnace.

"**Vent connector**" is a pipe for conveying products of combustion from a fuel-burning appliance to a vent.

"**Water heater**" is an appliance for heating water for domestic purposes other than for space heating.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1480, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1490 Appliances—Installation. In addition to requirements of the Washington State Ventilation and Indoor Air Quality Code:

(1) The installation of each appliance must conform to the manufacturer's installation instructions. The manufacturer's instructions must be attached to the appliance.

(2) Combustion air inlets and flue gas outlets must be listed as components of the appliance and must be completely separated. The required separation may be obtained by:

(a) The installation of direct vent system (sealed combustion system) appliances; or

(b) The installation of appliances within enclosures so that the appliance combustion system and venting system are separate from the interior atmosphere of the commercial coach. There must not be any door, removable access panel, or other opening into the enclosure from inside the commercial coach. Any openings for ducts, piping, wiring, etc., must be sealed.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1490, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1500 Safety devices—Water heater relief valves. In addition to requirements of the Washington State Ventilation and Indoor Air Quality Code:

(1) All water heaters must be installed with approved fully automatic valve or valves designed to provide temperature and pressure relief. Temperature and pressure relief valves must be tested and approved to ANSI Z21.22 standard or equal.

(2) Any temperature relief valve or combined pressure and temperature relief valve installed for this purpose must have the temperature sensing element immersed in the hottest water within the upper six inches of the tank. It must be set to start relieving at a pressure of 150 psi or the rated working pressure of the tank, whichever is lower, and at or below a water temperature of 210 degrees Fahrenheit.

(3) Relief valves must be provided with full-sized drains. Drains must be directed to the exterior sides of the unit, exiting at least six inches above the ground, and each drain pipe must exhaust with a ninety degree downward turn. Drain lines must be of a material approved for hot water distribution and must drain fully by gravity, must not be trapped, and must not have their outlets threaded.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1500, filed 10/23/96, effective 11/25/96.]

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WAC 296-150C-1510 Air ducts—Expandable or multiple commercial coach connections. In addition to the requirements of the Uniform Mechanical Code and the Washington State Energy Code air ducts for:

(1) An expandable or multiple commercial coach may have ducts of the heating system installed in the various units. The points of connection must be so designed and constructed that when the commercial coach is fully expanded or coupled, the resulting duct joint will conform to the requirements of this chapter.

(2) Installation instructions for supporting the crossover duct from the commercial coach must be provided for on-site installation. The duct must not touch the ground.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1510, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1520 Air ducts—Duct and plenum insulation. Every heating and cooling duct and plenum must be installed according to the Uniform Mechanical Code and the Washington State Energy Code.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1520, filed 10/23/96, effective 11/25/96.]

PLUMBING

WAC 296-150C-1530 Plumbing—General. This chapter also applies to the installation of plumbing equipment in any commercial coach bearing or required to bear a department insignia. Plumbing fixtures, equipment, and installations in commercial coaches must conform to the provisions of the Uniform Plumbing Code and the amendments adopted by the State Building Code Council, except part 1, unless specifically exempted or required by this section.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1530, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1540 Plumbing—Definitions. The definitions listed below, in addition to the Uniform Plumbing Code definitions apply to this chapter.

"**Drain outlet**" is the discharge end of the commercial coach main drain to which a drain connector may be attached.

"**Main drain**" is the principal artery of the commercial coach drainage system to which drainage branches may be connected.

"**Water-supply connection**" is the fitting or point of connection of the commercial coach water distribution system designed for connection to a water connector.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1540, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1550 Drainage—Cap or plug. Drain outlets must be equipped with a watertight cap or plug that is permanently attached to the vehicle.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1550, filed 10/23/96, effective 11/25/96.]

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WAC 296-150C-1560 Drainage—Clearance from drain outlet. The drain outlet and couplers must have a minimum clearance of three inches in any direction from all parts of the structure or appurtenances and at least eighteen inches unrestricted clearance directly in front of the drain outlet.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1560, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1570 Water supply connection. (1) Each commercial coach equipped with a water distribution system must have a water-supply connection that terminates within eighteen inches of the outside wall of the commercial coach.

(2) Water-supply connections must be equipped with a watertight cap or plug that is permanently attached to the commercial coach.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1570, filed 10/23/96, effective 11/25/96.]

VENDOR UNIT CONVERSION CODE

GENERAL

WAC 296-150C-1580 What manufacturing codes apply when converting structures to vendor units? (1) The conversion of a structure to a vendor unit must comply with the following codes:

(a) The Uniform Mechanical Code, with the amendments made by the Washington State Building Code Council, chapter 51-42 WAC;

(b) The National Electrical Code as referenced in chapter 19.28 RCW and chapter 296-46 WAC, Installing Electric Wires and Equipment;

(c) The Uniform Plumbing Code 1997 edition with the amendments under chapter 19.27 RCW; and

(d) The Washington State Building Code Council, chapter 51-40 WAC, Uniform Building Code, Chapter 11, Accessibility as applies to the exterior of the unit relating to customer service facilities in section 1105.4.7.

(2) All construction methods and installations must use accepted engineering practices, provide minimum health and safety to the occupants of commercial coaches and the public, and demonstrate journeyman quality of work of the various trades.

(3) Requirements for any size, weight, or quality of material modified by the terms "minimum," "not less than," "at least," and similar expressions are minimum standards. The person converting a structure to a vendor unit may exceed these rules provided the deviation does not result in inferior installation or defeat the purpose and intent of this chapter.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1580, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1580, filed 10/23/96, effective 11/25/96.]

STRUCTURAL

WAC 296-150C-1590 Is a structural analysis required when converting a vehicle or structure to a ven-

(1999 Ed.)

dor unit? (1) A "Type A vendor unit" is a commercial coach such as, but not limited to, a truck, van, or step van that meet the requirements of this chapter. Conversion of a truck, van or step van to a "Type A vendor unit" requires an engineering analysis or structural test to determine if the vehicle is structurally acceptable for use as a Type A vendor unit.

(2) A "Type B vendor unit" is a commercial coach such as, but not limited to, a recreational vehicle as defined by the American National Standard Institute, Inc. Conversion of a structure to a Type B vendor unit requires an engineering analysis or structural tests to determine whether it is structurally acceptable for use.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1590, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1590, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1600 What are the live load requirements of a vendor unit? (1) The design live loads for vendor units are:

- (a) Roof 25 psf
- (b) Floor 40 psf

(2) No wind load design is required.

(3) The roof live load and the floor live load must be considered to act both simultaneously and separately in order to determine the critical design loading for stresses and deflections.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1600, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1600, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1610 Design load deflection. When a structural assembly is subjected to total design live loads, the deflection for structural framing members must not exceed the following:

$L =$ The clear span between supports or two times the length of a cantilever.

Floor	$L/240$
Roof	$L/180$

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1610, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1620 Structural load tests. (1) A structural assembly tested for qualification must sustain the design dead load plus the superimposed design live loads for vendor units (see WAC 296-150C-1600) equal to 1.75 times the required live loads for a period of twelve hours without failure of the assembly.

(2) An assembly failure is defined as a rupture, fracture, or residual deflection which is greater than the limits set in WAC 296-150C-1610.

Note: We will provide test procedure forms upon request.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1620, filed 10/23/96, effective 11/25/96.]

CONSTRUCTION

WAC 296-150C-1630 Roof coverings/membrane/weather resistant. (1) The roof covering must be securely

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fastened in an approved manner to the supporting roof construction and must provide weather protection for the vendor unit and the occupants.

(2) Exterior covering materials, including metal coverings, must be moisture and weather resistant and contain corrosion resistant fasteners to prevent wind and rain deterioration.

Note: Electro-plated, electro-deposited zinc, and electro-galvanized staples are not considered corrosion-resistant materials.

(3) All exterior openings or penetrations into the commercial coach around piping, ducts, plenums, or vents must be sealed with moisture-resistant material.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1630, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1640 Floors. Wood floors must be made moisture resistant by an overlay of nonabsorbent material applied with water-resistant adhesive.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1640, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1650 Floor closure material. (1) Floor closure material around piping, ducts, plenums, or vents must prevent damage to the underside of the vendor unit due to air, water, insects, dust, and be rodent resistant.

(2) The floor closure material must meet ASTM D-781 standard or equal and be installed as follows:

(a) Fibrous material (with or without patches) must meet or exceed the level of forty-eight inch-pounds of puncture resistance as tested.

(b) Patching material must be installed according to installation instructions furnished by the supplier of the material.

(c) The material must be suitable for patches and the patch life must be equivalent to the material life.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1650, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1660 Chassis approval. The vendor unit chassis and running gear can be approved by either:

(1) Engineering calculations done per WAC 296-150C-1080; or

(2) A letter from an engineer which certifies that the chassis will support the loads imposed upon the chassis. This letter must be sealed with a wet stamp and signed by the engineer who made the analysis.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1660, filed 10/23/96, effective 11/25/96.]

MATERIALS

WAC 296-150C-1670 Standards for equipment and installations. (1) The manufacturer's equipment and installation specifications must be followed. Other approved standards are acceptable when:

- Installed according to the manufacturer's installation instructions; and
- Approved by a listing or testing agency.

Note: Gas furnaces, gas water heaters, and gas refrigerators *must* be sealed combustion or completely separated from the interior of the vendor unit.

(2) No solid fuel (e.g., charcoal) appliances may be installed in a vendor unit.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1670, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1680 Flame-spread limitations. For flame-spread requirements see WAC 296-150C-1100.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1680, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1690 Cabinet protection. (1) The bottom and sides of combustible cabinets over cooking appliances or tops including a space of six inches from the edge of the burners must be protected with at least one-quarter inch thick asbestos millboard covered with at least 26 gauge sheet metal (.017 stainless steel, .024 aluminum or .020 copper) or equivalent protection. The protective metal over the range must form a hood with not less than a three-inch eyebrow (measuring horizontally from face of cabinet).

(2) The hood must be centered over and at least as wide as the top of the cooking appliance.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1690, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1700 Insulation standards. When a source of heating or cooling is installed, the vendor unit must comply with the Washington State Energy Code, unless another state law supersedes the Washington State Energy Code.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1700, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1710 Light and ventilation. Each bathroom must be provided with artificial light and with a window having at least 1/2 square feet of glazed area that can be fully opened, except where a mechanical ventilation system is installed. Any mechanical ventilation system must exhaust directly to the outside of the vendor unit.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1710, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1720 What requirements apply to vending unit exits? At least one vending unit exit must comply with the following:

- (1) Exterior doors must be constructed for exterior use.
- (2) The exterior door must be at least thirty-inches wide by seventy-two inches high.

(3) Each swinging exterior door must have a key-operated lock that has a deadlock latch. A deadlock with a passage set installed below the deadlock may be used as an acceptable alternate for each exterior door. The locking mechanism must

be engaged or disengaged by the use of a lever, knob, button, handle, or other device from the interior of the vending unit.

(4) Locks must not require the use of a key for operation from the inside.

(5) Exit doors may either be hinged or sliding. Roll-up doors may not be used to meet the requirements of this section.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1720, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1720, filed 10/23/96, effective 11/25/96.]

ELECTRICAL

WAC 296-150C-1730 What code and installation requirements apply to vendor unit electrical systems? The electrical system in any vendor unit must comply with the National Electrical Code as referenced in chapter 19.28 RCW, Article 550 and the applicable portions of other Articles as required by this section.

(1) Appliances must be installed per Articles 422 - Appliances.

(2) Generators must be installed per Article 445 - Generators.

(3) The unit must be served by a four-wire system. The neutral bar termination of the grounded circuit conductor must be isolated.

(4) Storage batteries subject to the provisions of this standard must be securely attached to the commercial coach. They must be installed in an area which is vapor-tight to the interior and ventilated directly to the exterior of the coach. When batteries are installed in a compartment, the compartment must be ventilated with openings of not less than two square inches at the top and two square inches at the bottom. Batteries must not be installed in a compartment containing spark or flame producing equipment, except in an engine generator compartment if the only charging source is the generator itself.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1730, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1730, filed 10/23/96, effective 11/25/96.]

MECHANICAL

WAC 296-150C-1740 What are the mechanical requirements for a vendor unit? (1) This chapter applies to the installation of mechanical, ventilation, and indoor air quality equipment in any vendor unit bearing or required to bear a department insignia. When mechanical, ventilation, and indoor air quality equipment is installed in or on a vendor unit, it must be installed according to the requirements of the Uniform Mechanical Code, the Washington State Ventilation and Indoor Air Quality Code, the rules of this chapter, and the conditions of the equipment approval or listing agency.

(2) For definitions of mechanical, see WAC 296-150C-1340.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1740, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1740, filed 10/23/96, effective 11/25/96.]

(1999 Ed.)

WAC 296-150C-1750 What are the LPG system enclosure and mounting requirements for a vendor unit?

(1) LPG containers must not be installed, nor stored temporarily, inside any vendor unit.

Exception: This prohibition does not apply to completely self-contained hand torches, lanterns, or similar equipment with containers having a maximum water capacity of two and one-half pounds (approximately one pound LPG capacity).

(2)(a) Containers, control valves and regulating equipment, when installed, must be mounted on the "A" frame of the vendor unit or installed in a compartment that is vapor-tight to the inside of the vendor unit and accessible only from the outside.

(b) The compartment must be ventilated at top and bottom to diffuse vapors. The compartment must be ventilated with two vents having an aggregate area of not less than two percent of the floor area of the compartment and must open without restriction to the outside. The required vents must be equally distributed between the floor and ceiling of the compartment. If the lower vent is located in the access door or wall, the bottom edge of the vent must be flush with the floor level of the compartment. The top vent must be located in the access door or wall with the bottom of the vent not more than twelve inches below the ceiling level of the compartment. All vents must have an unrestricted discharge to the outside atmosphere. Access doors or panels of compartments must not be equipped with locks or require special tools or knowledge to open.

(3) Doors, hoods, domes, or portions of housings and enclosures required to be removed or opened for container replacement must incorporate means for clamping them firmly in place and preventing them from working loose during transit. Provisions must be incorporated in the assembly to hold the containers firmly in position and prevent their movement during transit.

(4) LPG containers must be mounted on a substantial support or a base secured firmly to the vendor unit chassis. Neither the container nor its support can extend below the vendor unit frame.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1750, filed 6/30/98, effective 7/31/98.]

WAC 296-150C-1751 What are the fuel gas piping design requirements for a vendor unit? Vendor units requiring fuel gas for any purpose must be equipped with a gas piping system that is designed for LPG only or combination LPG and natural gas.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1751, filed 6/30/98, effective 7/31/98.]

WAC 296-150C-1752 Can gas tubing be concealed in a vendor unit? (1) Tubing must not be run inside walls, floors, partitions, or roofs.

(2) If tubing passes through walls, floors, partitions, roofs, or similar installations, the tubing must be protected by the use of weather resistant grommets that snugly fit both the tubing and the hole through which the tubing passes.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1752, filed 6/30/98, effective 7/31/98.]

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WAC 296-150C-1753 What are the pipe-joint compound requirements for gas piping in a vendor unit? (1) Screw joints must be made tight with pipe-joint compound that is insoluble in liquefied petroleum gas.

(2) Pipe-joint compound must be approved for the type of gas used. The pipe-joint compound must be applied to the male threads only.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1753, filed 6/30/98, effective 7/31/98.]

WAC 296-150C-1754 What are the gas piping hanger and support requirements for a vendor unit? (1) All gas piping must be adequately supported by galvanized or equivalently protected metal straps or hangers at intervals of not more than four feet, except where adequate support and protection is provided by structural members.

(2) Gas pipe supply connections must be rigidly anchored to a structural member within six inches of the supply connections.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1754, filed 6/30/98, effective 7/31/98.]

WAC 296-150C-1755 What are the electrical bonding requirements for gas piping in a vendor unit? (1) Gas piping must not be used for an electrical ground.

(2) The gas line must be bonded.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1755, filed 6/30/98, effective 7/31/98.]

WAC 296-150C-1756 How are gas supply connections in a vendor unit identified? A label must be permanently attached on the outside of the exterior wall of the vendor unit adjacent to the gas supply connection which provides the following information:

(1) The type of system (i.e., liquid petroleum system or natural gas system or combination liquid petroleum and natural gas system);

(2) The appropriate Btuh input rating; and

(3) If excess ("or more") Btuh input is allowed.

For example: Natural Gas System
250,000 Btuh
Or More

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1756, filed 6/30/98, effective 7/31/98.]

WAC 296-150C-1757 What requirements apply to gas piping system openings? All openings in the gas piping system must be closed gas-tight with threaded pipe plugs or pipe caps.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1757, filed 6/30/98, effective 7/31/98.]

WAC 296-150C-1758 Are gas piping shut-off valves required in a vendor unit? (1) In addition to any valve on the appliance, a shut-off valve must be installed in the fuel piping outside of each gas appliance but inside the vendor unit structure and upstream of the union or connector. The shut-off valve must be located within six feet of a cooking appliance and within three feet of any other appliance. A shut-off valve may serve more than one appliance if located as required above.

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(2) Shut-off valves used in connection with gas piping must be of a type designed for use with liquefied petroleum gas. Shut-off valves must be tested and approved to ANSI Z21.15 standard or equal.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1758, filed 6/30/98, effective 7/31/98.]

WAC 296-150C-1759 What requirements apply to testing for gas piping leaks before vendor unit appliances are connected? (1) The piping system must stand a pressure of at least ten psi gauge for a period of not less than fifteen minutes without showing any drop in pressure.

(2) Pressure must be measured with a gauge calibrated to be read in increments of not greater than one-tenth pound.

(3) The source of pressure must be isolated before the pressure tests are made. Before a test is begun, the temperature of the ambient air and of the piping must be approximately the same, and constant air temperature must be maintained throughout the test.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1759, filed 6/30/98, effective 7/31/98.]

WAC 296-150C-1760 What requirements apply to testing for gas piping leaks after vendor unit appliances are connected? (1) After gas appliances have been connected, the gas-piping system must be subjected to a pressure test with the burner valves closed. The test consists of air at not less than ten inches nor more than fourteen inches pressure of water column (six to eight ounces). The system must hold this pressure for a period of not less than ten minutes with no leakage. Before beginning the test, the temperature of the gas-piping system and the test air must be equalized, and this shall be maintained throughout the test.

(2) Appliance shut-off valves ahead of gas cooking appliances may be closed for the performance of this test. When the test is satisfactorily performed, these valves must be opened and, while the system is under pressure, the appliance connectors must be tested with an approved leak detector or approved bubble solution.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1760, filed 6/30/98, effective 7/31/98.]

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150C-1760, filed 6/30/98, effective 7/31/98.]

WAC 296-150C-1770 Appliances—Installation. In addition to requirements of the Washington State Ventilation and Indoor Air Quality Code:

(1) The installation of each appliance must conform to the manufacturer's installation instructions. The manufacturer's instructions must be attached to the appliance.

(2) Combustion air inlets and flue gas outlets must be listed as components of the appliance and must be completely separated. The required separation may be obtained by:

(a) The installation of direct vent system (sealed combustion system) appliances; or

(b) The installation of appliances within enclosures so that the appliance combustion system and venting system are separate from the interior atmosphere of the commercial coach. There must not be any door, removable access panel, or other opening into the enclosure from the inside of the commercial coach. Any openings for ducts, piping, wiring, etc., must be sealed.

(3) Ranges, cooktops, and ovens must not burn outside combustion air.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1770, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1780 Safety devices—Water heater relief valves. (1) All water heaters must be installed with approved fully automatic valve or valves designed to provide temperature and pressure relief. Temperature and pressure relief valves must be tested and approved to ANSI Z21.22 standard or equal.

(2) Any temperature relief valve or combined pressure and temperature relief valve installed for this purpose must have the temperature sensing element immersed in the hottest water within the upper six inches of the tank. It must be set to start relieving at a pressure of 150 psi or the rated working pressure of the tank, whichever is lower, and at or below a water temperature of 210 degrees Fahrenheit.

(3) Relief valves must be provided with full-sized drains. Drains must be directed to the exterior of the unit, exiting at least six inches above the ground, and must exhaust downward. Drain lines must be of a material approved for hot water distribution and must drain fully by gravity, must not be trapped, and must not have their outlets threaded.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1780, filed 10/23/96, effective 11/25/96.]

PLUMBING

WAC 296-150C-1790 Plumbing—General. This chapter also applies to the installation of plumbing equipment in any vendor unit bearing or required to bear a department insignia. Plumbing fixtures, equipment, and installations in vendor units must conform to the provisions of the Plumbing Code and the amendments adopted by the State Building Code Council, except part 1, unless specifically exempted or required by this section.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1790, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1800 Plumbing—Definitions. Definitions contained in the Uniform Plumbing Code apply to this chapter:

"Drain outlet" is the discharge end of the commercial coach main drain to which a drain connector may be attached.

"Main drain" is the principal artery of the commercial coach drainage system to which drainage branches may be connected.

"Water-supply connection" is the fitting or point of connection of the commercial coach water distribution system to a water connector.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1800, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1810 Drainage—Cap or plug. Drain outlets must be equipped with a watertight cap or plug that must be permanently attached to the vehicle.

(1999 Ed.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1810, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1820 Drainage—Clearance from drain outlet. The drain outlet and couplers must have a minimum clearance of three inches in any direction from all parts of the structure or appurtenances and with at least eighteen inches unrestricted clearance directly in front of the drain outlet.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1820, filed 10/23/96, effective 11/25/96.]

WAC 296-150C-1830 Water supply connection. Water-supply connections must be equipped with a watertight cap or plug that must be permanently attached to the vehicle.

Note: The department of health may have more restrictive requirements. Before modifying your unit to comply with these requirements be sure to contact them.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-1830, filed 10/23/96, effective 11/25/96.]

COMMERCIAL COACH FEES

WAC 296-150C-3000 Commercial coach fees.

WAC 296-150C-3000 COMMERCIAL COACH FEES	
INITIAL FILING FEE	\$27.00
DESIGN PLAN FEES:	
INITIAL FEE-MASTER DESIGN	\$184.50
INITIAL FEE-ONE YEAR DESIGN	\$75.75
RENEWAL FEE	\$32.50
RESUBMIT FEE	\$54.00
ADDENDUM	\$54.00
ELECTRICAL PLAN REVIEW (When required by WAC 296-46-140, Plan review for educational, institutional or health care facilities and other buildings.)	
Electrical plan submission fee	\$54.00
Service/feeder Ampacity:	
0 - 100	\$24.00
101 - 200	\$30.00
201 - 400	\$56.00
401 - 600	\$66.00
601 - 800	\$85.00
801 - 1000	\$104.00
Over 1000	\$113.00
Over 600 volts surcharge	\$18.00
Thermostats:	
First	\$11.00
Each additional	\$3.00
Low voltage fire alarm and burglar alarm:	
Each control panel and up to four circuits or zones	\$10.00
Each additional circuit or zone	\$2.00
Generators, refer to appropriate service/feeder ampacity fees	
<i>Note: Altered services or feeders shall be charged the above rate per the service/feeder ampacity fees.</i>	
Supplemental submissions of plans (resubmittals, addendum's, renewals, code updates, etc.) shall be charged per hour or fraction of an hour.*	
	\$64.00
RECIPROCAL PLAN REVIEW:	
INITIAL FEE - MASTER DESIGN	\$82.50
INITIAL FEE - ONE YEAR DESIGN	\$50.00
RENEWAL FEE	\$50.00
ADDENDUM	\$50.00
PLANS APPROVED BY PROFESSIONALS	
	\$37.75
APPROVAL OF EACH SET OF DESIGN PLANS BEYOND FIRST TWO SETS	
	\$10.50
DEPARTMENT INSPECTION FEES:	
INSPECTION/REINSPECTION (Per hour* plus travel time* and mileage**)	\$54.00
TRAVEL (PER HOUR)*	\$54.00
PER DIEM**	
HOTEL***	
MILEAGE**	
RENTAL CAR***	
PARKING***	
AIRFARE***	

WAC 296-150C-3000 COMMERCIAL COACH FEES	
DEPARTMENT AUDIT FEES:	
AUDIT (PER HOUR) *	\$54.00
TRAVEL (PER HOUR) *	\$54.00
PER DIEM **	
HOTEL ***	
MILEAGE **	
RENTAL CAR ***	
PARKING ***	
AIRFARE ***	
INSIGNIA FEES:	
FIRST SECTION	\$16.00
EACH ADDITIONAL SECTION	\$10.50
ALTERATION	\$27.00
REISSUED-LOST/DAMAGED	\$10.50
OTHER FEES:	
FIELD TECHNICAL SERVICE (Per hour* plus travel time* and mileage**)	\$54.00
PUBLICATION PRINTING AND DISTRIBUTION OF RCW'S AND WAC'S (One free copy per year)	\$10.50
* Minimum charge of 1 hour; time spent greater than 1 hour is charged in 1/2 hour increments	
** Per state guidelines.	
*** Actual charges incurred.	

[Statutory Authority: Chapters 18.106, 18.27 and 43.22 RCW. 98-12-041, § 296-150C-3000, filed 5/29/98, effective 6/30/98. Statutory Authority: RCW 70.87.030, 18.27.070, [18.27.]075, 43.22.350, [43.22.]355, [43.22.]434 and [43.22.]480(2). 97-11-053, § 296-150C-3000, filed 5/20/97, effective 6/30/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150C-3000, filed 10/23/96, effective 11/25/96.]

Chapter 296-150F WAC

FACTORY-BUILT HOUSING AND COMMERCIAL STRUCTURES

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FACTORY-BUILT HOUSING AND COMMERCIAL STRUCTURE FEES

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WAC 296-150F-0010 Authority, purpose, and scope.

(1) This chapter is authorized by RCW 43.22.420, 43.22.434 and 43.22.450 through 43.22.490, covering the construction and approval of factory-built housing and commercial structures before occupancy.

(2) This chapter applies to the approval:

(a) Of factory-built structures used for residences or commercial purposes; and

(b) After occupancy of a factory-built house or commercial structure, all inspections are done by the local enforcement agency.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0010, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0020 What definitions apply to this chapter? "Approved" is approved by the department of labor and industries.

"Building site" is a tract, parcel, or subdivision of land on which a factory-built house or commercial structure will be installed.

"Closed construction" is a factory-built house, commercial structure, or component that is not open for visible inspection at the building site. It may enclose factory-installed structural, mechanical, electrical, plumbing, or other systems and equipment.

"Commercial structure" is a structure designed or used for human habitation (such as a dormitory) or human occupancy for industrial, educational, assembly, professional, or commercial purposes. It may also include a component.

"Component" is a discrete element that cannot be inspected at the time of installation either in the factory or in a site-built unit, but is:

- Designed to be installed in a structure;
- Manufactured as a unit; and
- Designed for a particular function or group of functions.

A component may be a floor, wall panel, roof panel, plumbing wall, electrical service wall, or heating assembly.

It may also be a service core. A service core is a factory assembled, three-dimensional section of a building. It may include mechanical, electrical, plumbing, and related systems.

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tems. It may be a complete kitchen, bathroom, or utility room. Service cores are referred to as "wet boxes," "mechanical cores," or "utility cores."

Note: A roof truss is not considered a component.

"Damaged in transit" is damage that effects the integrity of the structural design or damage to any other system referenced in the codes required by the State Building Code, or other applicable codes.

"Department" is the department of labor and industries. The department may also be referred to as "we" or "us" in this chapter. Note: You may contact us at: Department of Labor and Industries, Specialty Compliance, PO Box 44440, Olympia, WA 98504-4440.

"Design plan" is a plan for the construction of factory-built housing, commercial structures, or components that includes floor plans, elevation drawings, specifications, engineering data, or test results necessary for a complete evaluation of the design.

"Design option" is a design that a manufacturer may use as an option to its design plan.

"Equipment" is all material, appliances, devices, fixtures, fittings, or accessories used in the manufacture, assembly, installation, or alteration of factory-built housing, commercial structures, and components.

"Factory assembled structure (FAS) advisory board" is a board authorized to advise the director of the department regarding the issues and adoption of rules relating to factory-built housing, commercial structures and components. (See RCW 43.22.420.)

"Factory-built housing" is housing designed for human occupancy such as a single-family dwelling. The structure of any room is entirely or substantially prefabricated or assembled at a place other than a building site. It may also include a component. A factory-built house is also referred to as a "modular" structure. Factory-built housing does not include manufactured (mobile) housing. (See RCW 43.22.450(3).)

"Insignia" is a label that we attach to a structure to verify that a factory-built house or commercial structure meets the requirements of this chapter. It could also be a stamp or label attached to a component to verify that it meets the requirements of this chapter.

"Install" is to erect or set in place a structure at a building site. It may also be the construction or assembly of a component as part of a factory-built house or commercial structure.

"Listed" is a piece of equipment, a component, or an installation that appears in a list published by a testing or listing agency and is suitable for use in a specified manner.

"Listing agency" is an organization whose business is approving equipment, components, or installations for publication.

"Local enforcement agency" is an agency of city or county government with power to enforce local regulations governing the installation of factory-built housing and commercial structures.

"Master design plan" is a design plan that expires when a new State Building Code has been adopted.

(1999 Ed.)

"Manufacturing" is making, fabricating, forming, or assembling a factory-built house, commercial structure, or component.

"One-year design plan" is a design plan that expires one year after approval or when a new State Building Code has been adopted.

"Repair" is the replacement, addition, modification, or removal of any construction, equipment, system, or installation to correct damage in transit or during on-site installation before occupancy.

"Unit" is a factory-built house, commercial structure, or component.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150F-0020, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0020, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0030 How is this chapter enforced?

(1) To enforce this chapter, we or another governmental inspection agency will inspect each factory-built house and commercial structure that is sited in Washington. Inspections will be conducted during normal work hours or at other reasonable times. (See WAC 296-150F-0070.)

(2) We will inspect each unit as required by the codes. (See WAC 296-150F-0500.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0030, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0040 Will you keep my manufacturing information confidential? We will only release manufacturing information such as design plans, specifications, and test results according to the requirements of the Public Records Act (see RCW 42.17.310 (1)(h)) unless we are ordered to do so by a court or otherwise required by law.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150F-0040, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0040, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0070 Do you have reciprocal agreements with other states to inspect factory-built housing and commercial structures, and components? (1) We have entered into reciprocal agreements with states who have construction standards that are equal to or greater than our standards for factory-built housing and commercial structures.

(2) When we have a reciprocal agreement with another state:

(a) The reciprocal state inspects factory-built housing, commercial structures, and components manufactured in that state before shipment into Washington to ensure compliance with our laws. After inspection, the reciprocal state applies our insignia.

(b) The department inspects factory-built housing, commercial structures, and components manufactured in Washington before shipment into the reciprocal state to ensure compliance with their laws. After inspection, we apply the insignia of the reciprocal state.

(3) We have reciprocal agreements on file.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0070, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0080 Do you allow a local enforcement agency to inspect factory-built housing, commercial structures, and components at the manufacturing location? (1) A local enforcement agency (city or county), under contract with us, can inspect factory-built housing, commercial structures, and components. In some cases their contract may be limited to specific portions of an inspection at specified manufacturing locations.

(2) After approving a unit, the local enforcement agency will attach the insignia, which indicates the unit has passed inspection.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0080, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0100 What happens if I disagree with your decision regarding my compliance with this chapter? (1) If we determine you are in violation of this chapter, you will receive a notice of noncompliance.

(2) If you disagree with our decision, you can send us a written request for a hearing, stating why you disagree.

(3) After we receive your hearing request, we will:

(a) Schedule a hearing within thirty days after we receive your request.

(b) Notify you of the time, date, and place for the hearing. If you fail to appear, your case will be dismissed.

(c) Hear your case.

(d) Send you written notice of our decision.

If you disagree with our decision, you may appeal it under the Administrative Procedure Act (chapter 34.05 RCW).

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150F-0100, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0100, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0110 Do you have an advisory board to address factory-built housing and commercial structure issues? The factory assembled structures (FAS) board advises us on issues relating to structural, plumbing, mechanical, electrical, installation, inspections, and rules for factory-assembled structures. (See RCW 43.22.420.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0110, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0120 Where can I obtain technical assistance regarding factory-built housing and commercial structures? We provide field technical service to factory-built housing and commercial structure manufacturers for an hourly fee. Field technical service may include an evaluation, consultation, plan examination, interpretation, and clarification of technical data relating to the application of our rules. It does not include inspections.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0120, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0130 How do I register a complaint?

A person who believes that a structure or component does not meet the requirements of this chapter may register a complaint with the department. The complaint must be in writing and must specifically describe the alleged violations of this chapter. Upon receipt of the complaint, the department will forward a copy to the appropriate manufacturer and/or dealer and they shall have thirty days to respond to it. If the department determines that an inspection is necessary, the manufacturer/dealer shall pay the department for the cost of the inspection. The cost of the inspection is based upon the fee schedule in WAC 296-150F-3000 and includes the hourly inspection fee, travel costs and other expenses incurred as a result of the inspection.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150F-0130, filed 6/30/98, effective 7/31/98.]

INSIGNIA

WAC 296-150F-0200 Who must purchase factory-built housing and commercial structure insignia? (1) You must obtain insignia from us for each factory-built house, commercial structure and component sited in Washington state.

(2) If you are a Washington state manufacturer, you do not need to purchase our insignia for your factory-built housing, commercial structures and components sold outside of Washington state.

(3) You must have an approved design plan and have passed inspection before an insignia can be attached to your factory-built home or commercial structure by us or our authorized agent.

(4) If a unit is damaged in transit after leaving the manufacturing location or during an on-site installation, and a repair is necessary, you must purchase an insignia from us. The insignia indicates that the unit was repaired.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150F-0200, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0200, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0210 What are the insignia requirements? (1) If you are applying for insignia for factory-built housing, commercial structures and components you must have your design plan approved and your units and components inspected and approved by us.

(2) We will attach the insignia after:

(a) We receive the required forms and fees from you (see WAC 296-150F-3000); and

(b) Your unit or component has passed final inspection. (See WAC 296-150F-0500.)

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150F-0210, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0210, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0220 How do I obtain insignia information and the required forms? Upon request, we will provide you with a packet of information that includes the required forms.

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[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0220, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0230 What are the insignia application requirements? (1) If you are requesting insignia for units that you intend to manufacture under a *new design plan*, your completed application must include:

(a) A completed design plan approval request form;

(b) One complete set of design plans, specifications, engineering analysis, test procedures and results, plus one additional set for each manufacturing location where the design plan will be used;

(c) At least one set of design plans must have an original wet stamp from a professional engineer or architect licensed in Washington state. We will retain the set with the original wet stamp; and

(d) A one-time initial filing fee, the design plan fee (if we approve your design plan) and the fee for each insignia. (See WAC 296-150F-3000.)

(2) If you are requesting insignia under an *approved design plan*, your completed application must include:

(a) A completed application for insignia form; and

(b) The fee for each insignia requested. (See WAC 296-150F-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0230, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0250 How do I replace lost or damaged insignia? (1) If an insignia is lost or damaged after it is attached to your factory-built house, commercial structure, or component, you may obtain a replacement insignia.

(2) You should contact us and provide the following information:

(a) Your name, address, and telephone number;

(b) The name of the manufacturer;

(c) The serial number;

(d) The manufacturer number (M#), if available;

(e) The insignia number, if available; and

(f) The required fee. (See WAC 296-150F-3000.)

(3) If we can determine that your unit previously had an insignia, we will attach an insignia to your unit once we receive your insignia fee. (See WAC 296-150F-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0250, filed 10/23/96, effective 11/25/96.]

DESIGN PLAN

WAC 296-150F-0300 When is design plan approval required? Design plans for factory-built housing and commercial structures prior to installation at the building site in Washington must be approved when:

(1) You build a new unit;

(2) You modify an approved design plan through an addendum; or

(3) You add options to an approved design plan through an addendum.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0300, filed 10/23/96, effective 11/25/96.]

(1999 Ed.)

WAC 296-150F-0310 Who can approve design plans?

(1) Design plans can be approved by us or by a licensed professional or firm authorized by us (see WAC 296-150F-0420 and 296-150F-0430).

(2) All electrical design plans for new or altered electrical installations for educational institutions, health care facilities, and other buildings (see chapters 296-46, 296-130, 296-140, and 296-150 WAC Table 1 or 2) must be reviewed and approved by us.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0310, filed 10/23/96, effective 11/25/96.]

DESIGN-PLAN APPROVAL BY THE DEPARTMENT

WAC 296-150F-0320 What must I provide with my request for design-plan approval by the department? All requests for design-plan approval must include:

(1) A completed design-plan approval request form;

(2) One complete set of design plans, specifications, engineering analysis, test procedures and results plus one additional set for each manufacturing location where the design plan will be used (see WAC 296-150F-0340 and 296-150F-0350);

(3) At least one set of design plans must have an original wet stamp from a professional engineer or architect licensed in Washington state. We will retain the set with the original wet stamp;

(4) A one-time initial filing fee and the design-plan fee (see WAC 296-150F-3000); and

(5) A "key drawing" to show the arrangement of modules if the plan covers three or more modules.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0320, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0340 What must an engineering analysis for design plans include? (1) The engineering analysis must show that the structural design meets the requirements of this chapter.

(2) An engineering analysis must be conducted according to accepted engineering practices and must be signed by a professional engineer or architect licensed in Washington state.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0340, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0350 What must the test procedures and results for design plans include? (1) Tests to a design for a factory-built home or commercial structure must be witnessed by a professional engineer or architect licensed in Washington state.

(2) Test reports must contain the following items:

(a) A description of the methods or standards that applied to the test;

(b) Drawings and a description of the item tested;

(c) A description of the test set-up;

(d) The procedure used to verify the correct load;

(e) The procedure used to measure each condition;

(f) Test data, including applicable graphs and observations of the characteristics and behavior of the item tested; and

(g) Analysis, comments, and conclusion.

(3) The written test procedures, results and conclusions must reference the applicable design plan.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0350, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0380 What happens if you approve my design plan? (1) Your design plan will be approved if it meets the requirements of this chapter.

(2) We will send you an approved copy of the design plan with the design-plan approval number.

(3) You must keep copies of the approved design plan at each location where a factory-built house, commercial structure, or component is built.

(4) If your design plan is not approved, you will be notified in writing of plan deficiencies. You may send a corrected design plan to us. (See WAC 296-150F-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0380, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0390 If my design plan is not approved, how much time do I have to submit a corrected design plan? (1) You have ninety days to correct and resubmit your original design plan and send us the resubmittal fee after we notify you of plan deficiencies. After ninety days, your initial design plan is returned to you.

(2) If you submit your corrected design plan after ninety days, you must send the initial design plan fee instead of the resubmittal fee. (See WAC 296-150F-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0390, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0400 What happens after my design plan is approved? Once your design plan is approved, we will inspect each related factory-built house, commercial structure, or component.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0400, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0410 When does my design plan expire? Master design plan:

(1) Your master design plan expires when there is a code change. You must submit new design plans for approval when there is a State Building Code cycle change. You may use your approved master design plans to order insignia as long as they comply with the applicable codes.

One-year design plan:

(2) Your factory-built home or commercial structure one-year design plan expires either one year after approval or when there is a code change. You must submit new design plans for approval when there is a State Building Code cycle change. You may use your design plan to order insignia as long as they comply with the applicable codes.

(3) All National Electrical Code amendments may be incorporated by an addendum to your design plan.

Note: The State Building Code is on a three-year code cycle which coincides with the State Building Code council amendment cycle. The National Electrical Code (NEC) cycle, however, does not coincide with the other code cycles.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0410, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0415 Who approves addendums to design plans approved by the department? You must have us approve an addendum to a design plan, if we initially approved your design plan.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0415, filed 10/23/96, effective 11/25/96.]

DESIGN-PLAN APPROVAL BY A LICENSED PROFESSIONAL OR FIRM

WAC 296-150F-0420 Who can be authorized to approve design plans? (1) A professional engineer, architect or firm licensed by the state of Washington according to the Engineers Registration Act, chapter 18.43 RCW and/or the Architects Registration Act, chapter 18.08 RCW; or

(2) A professional engineer, architect or firm licensed in another state that has licensing or certification requirements that meet or exceed Washington requirements.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0420, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0430 What information must a professional or firm provide to be authorized to approve design plans? (1) Name, a copy of your certificate of registration, and address of the professional engineer or architect; or

(2) Name, a copy of your certificate of authority, and address of the firm; and

(3) A description of the services the professional engineer, architect, or firm will provide; and

(4) A description of the professional's area(s) of expertise and qualifications which include:

(a) A summary of the professional's or firm's experience; and

(b) Verification of experience in your area of expertise such as structural, mechanical, plumbing, energy, electrical, fire and life safety, and ventilation and indoor air quality.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0430, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0440 How will I know whether I am authorized to approve design plans? Within sixty days after you submit the information requested in WAC 296-150F-0430, we will send you a letter either approving or denying your authorization request.

(1) If we approve your request, your name is added to the list of licensed professionals and firms authorized to approve design plans.

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(a) We will authorize a professional to approve portions of a design plan within his or her area of expertise; and

(b) We will authorize an engineering or architectural firm to approve plans if the firm employs or contracts with professionals within the area of expertise necessary for the design plan.

(2) If we do not approve your request, we will notify you in writing why we are denying your request for authorization. If you disagree with our decision, you can send us a written request for a hearing, stating why you disagree. (See WAC 296-150F-0100.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0440, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0450 How long is a licensed professional or firms authorization effective? Your authorization to approve design plans is effective until your license expires, is revoked or is suspended.

(1) You must notify us of your license renewal at least fifteen days before your license expires, to prevent your name from being removed from our licensed professional and firm list.

(2) You must notify us immediately if your license is revoked or suspended. Your name is then removed from the list of licensed professionals and firms authorized to approve design plans.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0450, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0460 What information must a manufacturer provide when a professional or firm does the design plan approval? You must provide the following information with your approved design plan:

(1) A completed departmental design plan approval request form;

(2) Two or more sets of the design plans plus elevation drawings, specifications, engineering analysis, and test results and procedures necessary for a complete evaluation of the design. These design plans must have an original wet stamp, be signed, and dated by the approving professional(s) (see WAC 296-150F-0340 and 296-150F-0350);

(3) A cover sheet on the design plan noting which professional approved each portion of the design plan;

(4) A copy of the authorization letter from us;

(5) The design plan fee for design plans approved by professionals or firms (see WAC 296-150F-3000);

(6) A professional who designs and certifies that the factory-built home or commercial structure design meets state requirements cannot also approve the design plan in the plan approval process;

(7) A professional cannot approve those electrical designs listed in WAC 296-150F-0310(2); and

(8) A professional cannot approve plans submitted under a reciprocal agreement.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150F-0460, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0460, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0470 What happens after we receive the professional or firm approved design plan and information? (1) After we receive your approved design plans and information, we will review the information and assign a plan approval number. We will send a copy of the design plan with the plan approval number to the manufacturer.

(2) We may periodically audit design plans approved by a professional engineer, architect, or firm to ensure compliance with design plan requirements. The department's periodic audit should not be construed as certifying that the plans are safe.

(3) If the audit reveals that the design plans approved by the professionals and firms do not comply with this chapter, you will be notified and required to pay our fees for review and approval of the design plans. (See WAC 296-150F-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0470, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0480 Do you have a list of professionals or firms that are authorized to submit design plans? We will maintain a list of the licensed professionals and firms that are authorized to approve design plans for factory-built housing and commercial structures.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0480, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0490 Who approves addendums to design plans approved by a professional or firm? (1) You must have the professional or firm approve an addendum to a design plan, if they initially approved your design plan.

(2) If the professional or firm who approved your design plan is no longer on the department list you may have us approve your addendum.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0490, filed 10/23/96, effective 11/25/96.]

INSPECTIONS PRIOR TO ISSUANCE OF AN INSIGNIA

WAC 296-150F-0500 When is an inspection required? (1) Before we issue an insignia, each factory-built house, commercial structure, and component must be inspected at the manufacturing location as many times as are required by the codes. (See WAC 296-150F-0600.) Inspections may include:

- (a) A "cover" inspection during construction of the unit before the electrical, plumbing, mechanical, and structural systems are covered;
- (b) Insulation and vapor barrier inspection, if required;
- (c) Other required code inspections;
- (d) A final inspection after the factory-built house, commercial structure, or component is complete;

Note: Each factory-built house, commercial structure, and component must have a serial number to enable us to track inspections.

(2) If we discover a violation during inspection, we will issue a notice of noncompliance. You can correct the viola-

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tion during the inspection. If you cannot correct the violation during inspection, you must leave the item uncovered until we approve your correction.

(3) After a unit is manufactured but before occupancy, we must inspect a factory-built house or commercial structure if it is damaged in transit to the building site or during on-site installation. This is considered a repair inspection. (See WAC 296-150F-0540.)

(4) Approved design plans must be available in compliance with the applicable sections of adopted state codes.

(5) Once your unit is inspected and approved we will attach the insignia.

Note: We only inspect factory-built housing and commercial structures before occupancy. After occupancy, the local enforcement agency is the inspection agency.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150F-0500, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0500, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0510 How do I request an inspection? (1) You must contact us, and we will let you know where your request for inspection should be submitted. Our address is noted in the definition of department.

(2) We must receive in-state inspection requests at least seven calendar days prior to the date that you want the inspection.

(3) We must receive out-of-state inspection requests at least fourteen calendar days prior to the date that you want the inspection.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0510, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0520 What happens if my factory-built house or commercial structure passes inspection? (1) If your factory-built house or commercial structure passes inspection and you have met the other requirements of this chapter, we will attach the insignia.

(2) After our final inspection, we will send a notice to the local enforcement agency (NLEA) indicating whether further inspection is necessary. (See WAC 296-150F-0550.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0520, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0530 Am I charged if I request an inspection but I am not prepared? (1) If you ask us to inspect a factory-built house or commercial structure within Washington state but you are not prepared when we arrive, you must pay the minimum inspection fee and travel. (See WAC 296-150F-3000.)

(2) If you ask us to inspect a factory-built home, commercial structure, or component outside Washington state but you are not prepared when we arrive, you must pay the minimum inspection fee, travel, and per diem expenses. (See WAC 296-150F-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0530, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0540 Who inspects factory-built housing and commercial structures for installation at the building site? (1) The local enforcement agency (city or county) must approve the installation.

(2) The local enforcement agency may also request a set of design plans and specifications for the unit from you.

(3) After the unit is manufactured but before occupancy, we must inspect a factory-built house or commercial structure if it is damaged in transit to the building site or during on-site installation. This is considered a repair inspection.

Note: The local enforcement agency may not open the concealed construction of a factory-built house or commercial structure to inspect if our insignia is attached.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0540, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0550 Do you notify the local enforcement agency after your final inspection of factory-built structures at a manufacturing location? After we perform a final inspection of a factory-built, commercial structure, or component, we will send a notice to the local enforcement agency (NLEA) that:

(1) Specifies what connections, standards, and incomplete items the local enforcement agency must check when the unit is installed; and/or

(2) Estimates the expected time of arrival of the factory-built house or commercial structure to the site.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0550, filed 10/23/96, effective 11/25/96.]

USED FACTORY-BUILT STRUCTURES WITHOUT AN INSIGNIA

WAC 296-150F-0580 Must I obtain an insignia for used factory-built structures? All used factory-built housing and commercial structures that are to be installed on a building site in Washington state must have an insignia of approval from us prior to being installed on a building site.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0580, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0590 How do I obtain insignia for used factory-built structures? We consider used factory-built housing and commercial structures as new structures for purposes of insignia approval. To obtain insignia, you must:

(1) Have the design plan approved by us (see WAC 296-150F-0300 through 296-150F-0480);

(2) Purchase insignia (see WAC 296-150F-0200 through 296-150F-0230); and

(3) Pass a unit inspection (see WAC 296-150F-0500 through 296-150F-0550).

Note: You will be required to open up as much of the construction of the unit as is necessary for inspection to show compliance with your approved design plan.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0590, filed 10/23/96, effective 11/25/96.]

[Title 296 WAC—p. 2038]

CODES FOR FACTORY-BUILT HOUSING, COMMERCIAL STRUCTURES, AND COMPONENTS

WAC 296-150F-0600 What manufacturing codes apply to factory-built housing and commercial structures? (1) All design, construction, installations, and alterations of factory-built housing, commercial structures, and components must conform with the following codes and the requirements of this chapter:

(a) The State Building Code, chapter 19.27 RCW;

Note: The Uniform Building Code reference to "building official" means the chief prefabricated building specialist or authorized representative at the department of labor and industries.

(b) The Energy Related Building Standards, chapter 19.27A RCW;

(c) The National Electrical Code as referenced in chapter 19.28 RCW and chapters 296-46 and 296-401 WAC.

(2) All construction methods and installations must use accepted engineering practices, provide minimum health and safety to the occupants of factory-built structures and the public, and demonstrate journeyman quality of work of the various trades.

(3) Requirements for any size, weight, or quality of material modified by the terms "minimum," "not less than," "at least," and similar expressions are minimum standards. The manufacturer may exceed these standards, provided the deviation does not result in inferior installation or defeat the purpose and intent of the standard.

Note: The codes, RCW's, and WAC's referenced in this rule are available for reference at the Washington State Library, the Washington State Law Library, and may be available at your local library.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0600, filed 10/23/96, effective 11/25/96.]

MANUFACTURER'S NOTICE TO THE DEPARTMENT

WAC 296-150F-0700 Must manufacturers of factory-built housing and commercial structures notify you if they manufacture at more than one location? (1) If you are manufacturing factory-built housing and commercial structures at more than one location, approved design plans must be available at each manufacturing location.

(2) You are required to send us the following information for each manufacturing location:

(a) Company name;

(b) Mailing and physical address; and

(c) Phone and FAX number if available.

(3) You must update this information as it changes.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0700, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0710 Must manufacturers of factory-built housing and commercial structures notify you of a change in business name or address? (1) If you are moving, notify us in writing prior to a change of business name or address.

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(2) Your notice must include the change of name and address.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0710, filed 10/23/96, effective 11/25/96.]

WAC 296-150F-0720 Must manufacturers of factory-built housing and commercial structures notify you of a change in business ownership? (1) When a manufacturer changes ownership, the new owner must notify us in writing immediately.

(2) A new owner may continue to manufacture the units according to a prior approved design plan if the prior owner releases the design plan.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150F-0720, filed 10/23/96, effective 11/25/96.]

**FACTORY-BUILT HOUSING AND COMMERCIAL
STRUCTURE FEES**

WAC 296-150F-3000 Factory-built housing and commercial structure fees.

WAC 296-150F-3000 FACTORY-BUILT HOUSING AND COMMERCIAL STRUCTURE FEES	
INITIAL FILING FEE	\$37.75
DESIGN PLAN FEES:	
INITIAL FEE-MASTER DESIGN (CODE CYCLE)	\$184.50
INITIAL FEE-ONE YEAR DESIGN	\$108.25
RENEWAL FEE	\$37.75
RESUBMIT FEE	\$54.00
ADDENDUM	\$54.00
ELECTRICAL PLAN REVIEW (When required by WAC 296-46-140, Plan review for educational, institutional or health care facilities and other buildings.)	
Electrical plan submission fee	\$54.00
Service/feeder Ampacity:	
0 - 100	\$24.00
101 - 200	\$30.00
201 - 400	\$56.00
401 - 600	\$66.00
601 - 800	\$85.00
801 - 1000	\$104.00
Over 1000	\$113.00
Over 600 volts surcharge	\$18.00
Thermostats:	
First	\$11.00
Each additional	\$3.00
Low voltage fire alarm and burglar alarm:	
Each control panel and up to four circuits or zones	\$10.00
Each additional circuit or zone	\$2.00
Generators, refer to appropriate service/feeder ampacity fees	
<i>Note: Altered services or feeders shall be charged the above rate per the service/feeder ampacity fees.</i>	
Supplemental submissions of plans (resubmittals, addendum's, renewals, code updates, etc.) shall be charged per hour or fraction of an hour.*	
	\$64.00
RECIPROCAL PLAN REVIEW:	
INITIAL FEE - MASTER DESIGN	\$82.50
INITIAL FEE - ONE YEAR DESIGN	\$50.00
RENEWAL FEE	\$50.00
ADDENDUM	\$50.00
PLANS APPROVED BY PROFESSIONALS	\$37.75
APPROVAL OF EACH SET OF DESIGN PLANS BEYOND FIRST TWO SETS	\$10.50
DEPARTMENT INSPECTION FEES:	
INSPECTION/REINSPECTION (Per hour* plus travel time* and mileage**)	\$54.00
TRAVEL (PER HOUR)*	\$54.00
PER DIEM**	
HOTEL***	
MILEAGE**	
RENTAL CAR***	
PARKING***	
AIRFARE***	

WAC 296-150F-3000 FACTORY-BUILT HOUSING AND COMMERCIAL STRUCTURE FEES	
DEPARTMENT AUDIT FEES:	
AUDIT (PER HOUR)*	\$54.00
TRAVEL (PER HOUR)*	\$54.00
PER DIEM**	
HOTEL***	
MILEAGE**	
RENTAL CAR***	
PARKING***	
AIRFARE***	
INSIGNIA FEES:	
FIRST SECTION	\$151.75
EACH ADDITIONAL SECTION	\$15.00
REISSUED-LOST/DAMAGED	\$37.75
OTHER FEES:	
FIELD TECHNICAL SERVICE (Per hour* plus travel time* and mileage**)	\$54.00
NOTIFICATION TO LOCAL ENFORCEMENT AGENCY (NLEA)	\$22.50
PUBLICATION PRINTING AND DISTRIBUTION OF RCW'S AND WAC'S (One free copy per year)	\$10.50
* Minimum charge of 1 hour; time spent greater than 1 hour is charged in 1/2 hour increments	
** Per state guidelines.	
*** Actual charges incurred.	

[Statutory Authority: Chapters 18.106, 18.27 and 43.22 RCW, 98-12-041, § 296-150F-3000, filed 5/29/98, effective 6/30/98. Statutory Authority: RCW 70.87.030, 18.27.070, [18.27.]075, 43.22.350, [43.22.]355, [43.22.]434 and [43.22.]480(2), 97-11-053, § 296-150F-3000, filed 5/20/97, effective 6/30/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480, 96-21-146, § 296-150F-3000, filed 10/23/96, effective 11/25/96.]

- 296-150M-0360 When is design plan approval required for an alteration?
- 296-150M-0370 How do I obtain alteration design plan approval?
- 296-150M-0380 How will I know whether you have approved my design plan?
- 296-150M-0390 If my design plan is not approved, how much time do I have to submit a corrected plan?
- 296-150M-0400 How do I apply for alteration approval and obtain an alteration insignia?

INSPECTION

- 296-150M-0500 When must an inspection be requested?
- 296-150M-0530 Am I charged if I request an inspection but am not prepared when you arrive?

INSTALLATION REQUIREMENTS

INSTALLATION, PERMIT, INSPECTION, DISPUTE

- 296-150M-0600 Who establishes standards for installation of manufactured homes?
- 296-150M-0610 What instructions are used for a manufactured home installation?
- 296-150M-0620 Do local enforcement agencies have special requirements for installing manufactured homes in hazardous areas?
- 296-150M-0630 Who may install a manufactured home?
- 296-150M-0640 Does a person who installs a manufactured home need an installation permit?
- 296-150M-0650 Does a manufactured home installation require an inspection?
- 296-150M-0660 What are the requirements for on-site structures and who regulates them?
- 296-150M-0670 What happens if a dispute arises concerning an installation requirement?

MANUFACTURED HOME FEES

- 296-150M-3000 Manufactured home fees.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 296-150M-0700 Acceptable types of ground cover. [Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480, 96-21-146, § 296-150M-0700, filed 10/23/96, effective 11/25/96.] Repealed by 98-14-078, filed 6/30/98, effective 7/31/98. Statutory Authority: Chapter 43.22 RCW.
- 296-150M-0710 Clearance under manufactured homes. [Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480, 96-21-146, § 296-150M-0710, filed 10/23/96, effective 11/25/96.] Repealed by 98-14-078, filed 6/30/98, effective 7/31/98. Statutory Authority: Chapter 43.22 RCW.

**Chapter 296-150M WAC
MANUFACTURED HOMES**

WAC

- 296-150M-0010 Authority, purpose, and scope.
- 296-150M-0020 What definitions apply to this chapter?
- 296-150M-0040 Will you keep my manufacturing information confidential?
- 296-150M-0050 Can I sell or lease a manufactured home that has been posted with a prohibited sale or lease notice?
- 296-150M-0060 Who handles consumer complaints about manufactured homes?
- 296-150M-0100 What happens if I disagree with your decision regarding my compliance with the federal standards, ANSI, or this chapter?

INSIGNIA

- 296-150M-0200 What labels or insignia are required on my manufactured home?
- 296-150M-0250 How do I replace a lost or damaged insignia?
- 296-150M-0260 How do I replace a lost or damaged HUD label?

ALTERATIONS AND INSPECTIONS

ALTERATION APPROVAL

- 296-150M-0300 What approval do I need to alter a manufactured home?
- 296-150M-0306 What codes are used when altering a manufactured (mobile) home?
- 296-150M-0307 How may I obtain a copy of the Manufactured Home Construction and Safety Standards, Part 24, CFR 3280?
- 296-150M-0310 What happens if I fail to get your approval prior to altering a manufactured home?
- 296-150M-0320 What must I provide to request approval of an alteration?
- 296-150M-0330 How do I obtain alteration insignia information and the forms you require?
- 296-150M-0331 Does my alteration permit expire?
- 296-150M-0340 What must an engineering analysis for design plans include?
- 296-150M-0350 What must the test procedures and results for design plans include?

- 296-150M-0720 Water heater relief lines. [Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0720, filed 10/23/96, effective 11/25/96.] Repealed by 98-18-036, filed 8/27/98, effective 9/27/98. Statutory Authority: Chapters 43.22 and 34.05 RCW and Executive Order 97-02.
- 296-150M-0730 Heat pump. [Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0730, filed 10/23/96, effective 11/25/96.] Repealed by 98-14-078, filed 6/30/98, effective 7/31/98. Statutory Authority: Chapter 43.22 RCW.

WAC 296-150M-0010 Authority, purpose, and scope.

(1) This chapter is authorized by RCW 43.22.340 through 43.22.445. The law requires that any alteration to a manufactured home be approved by the department. A manufactured home with an approved alteration requires an alteration insignia. Alteration insignia can be purchased from us.

(2) The United States Department of Housing and Urban Development (HUD), manufactured housing standards division, has given us the authority to act as a manufactured home production Inspection Primary Inspection Agency (IPIA) and enforce 24 CFR 3280. As an IPIA:

(a) We are required to inspect every manufactured home built in Washington state sometime during production;

(b) We are authorized to audit the quality control program and the performance of quality control inspectors of manufactured home factories located in Washington state;

(c) We are authorized to supply a HUD label to the manufacturer following our inspection and approval of the manufactured home and the manufacturer's quality control program; and

(d) We are authorized to remove HUD labels according to the guidelines stated in the IPIA inspector's manual.

Note: A copy of our IPIA approval letter is on file at the department.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0010, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0020 What definitions apply to this chapter? "Alteration" is the replacement, addition, modification, or removal of any equipment or installation that affects the construction, planning considerations, fire safety, or the plumbing, mechanical, and electrical systems of a manufactured home. The installation of whole-house water treatment equipment that requires cutting into the existing plumbing is considered an alteration and requires a permit, an inspection and an alteration insignia.

The following are not considered alterations:

- Repairs to equipment with approved parts; or
- Modification of a fuel-burning appliance according to the listing agency's specifications; or
- Adjustment and maintenance of equipment.

"Alteration insignia" is an insignia issued by the department of labor and industries to verify that an alteration to a manufactured home meets the requirements of federal law 24 CFR 3280 and this chapter.

"Anchoring system" is the means used to secure a mobile home to ground anchors or to other approved fastening devices. It may include straps, cables, turnbuckles, bolts, fasteners, and other components.

"ANSI" is the American National Standards Institute, Inc., and the institute's rules applicable to manufactured homes, ANSI A225.1 Manufactured Homes Installation, 1994 edition, except section 3.5.2 - Ground Cover and section 4.1.3.3 - Clearance.

"Authority having jurisdiction" means that either the department of labor and industries or the local jurisdiction is responsible for establishing specific manufactured home standards. The authority for specific manufactured home standards is divided as follows:

- The department of labor and industries establishes standards for manufactured home installation and alterations and performs alteration inspections;
- The local jurisdiction establishes standards for manufactured homes governing the building site and performs installation inspections.

"Building site" is a tract, parcel, or subdivision of land on which a manufactured home is installed.

"DAPIA" is a Design Approval Primary Inspection Agency as approved by the United States Department of Housing and Urban Development.

"Department" is the department of labor and industries. The department may be referred to as "we" or "us" in this chapter. Note: You may contact us at: Department of Labor and Industries, Specialty Compliance, PO Box 44440, Olympia, WA 98504-4440.

"Design plan" is a design submitted to the department for approval of a manufactured home structural alteration.

"Equipment" is all material, appliances, devices, fixtures, fittings, or accessories used in the alteration or installation of a manufactured home.

"Footing" is the portion of a support system that transmits loads from the manufactured home to the ground.

"Foundation skirting" or **"skirting"** is the material that surrounds and encloses the space under the manufactured home.

"Homeowner" is an individual who owns a manufactured home for the purposes of this chapter.

"HUD" is the United States Department of Housing and Urban Development with headquarters located in Washington, D.C.

"Installation" is the activity needed to prepare a building site and to set a manufactured home within that site. Site means a tract, parcel, or subdivision of land including a mobile home park.

"IPIA" is a manufactured home production Inspection Primary Inspection Agency approved by the United States Department of Housing and Urban Development. The department of labor and industries is the IPIA for Washington state.

"Local enforcement agency" is an agency of city or county government with power to enforce local regulations governing the building site and installation of a manufactured home.

"Manufactured home" is a single-family dwelling built according to the Department of Housing and Urban Development Manufactured Home Construction and Safety Standards Act, which is a national, preemptive building code. A manufactured home also:

- Includes plumbing, heating, air conditioning, and electrical systems;

- Is built on a permanent chassis; and
- Can be transported in one or more sections with each section at least eight feet wide and forty feet long when transported; or when installed on the site is three hundred twenty square feet or greater (see RCW 46.04.302).

Note: Total square feet is based on exterior dimensions measured after installation using the longest horizontal projections. Dimensions may not include bay windows but may include projections containing interior space such as cabinets and expandable rooms.

Exception: A structure that meets the requirements of a manufactured home as set out in 24 CFR 3282.7(u), except the size requirements is considered a manufactured home, if the manufacturer files with the secretary of HUD a certificate noted in CFR 3282.13.

"Mobile home" is a factory-built dwelling built prior to June 15, 1976, to standards other than the HUD Code, and acceptable under applicable state codes in effect at the time of construction or introduction of the home into the state. Mobile homes have not been built since the introduction of the HUD Manufactured Home Construction and Safety Standards Act. For the purposes of this chapter references to manufactured homes include mobile homes.

"Park site" is the installation location of a manufactured home within a residential area for manufactured homes.

"Structural alteration-custom design" is a design that can only be used once.

"Structural alteration-master design" is a design plan that can be used more than once. The master plan expires when there is a code change applicable to the design.

"System" is part of a manufactured home designed to serve a particular function such as structural, plumbing, mechanical, or electrical functions.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150M-0020, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0020, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0040 Will you keep my manufacturing information confidential? We will only release manufacturing information such as design plans for structural alterations according to the requirements of the Public Records Act (see RCW 42.17.310 (1)(h)) unless we are ordered to do so by a court or otherwise required by law.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150M-0040, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0040, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0050 Can I sell or lease a manufactured home that has been posted with a prohibited sale or lease notice? (1) If we find your manufactured home violates this chapter or federal standards in 24 CFR 3280, we may attach a prohibited sale or lease notice to your unit.

(2) You may not sell, lease, or offer for sale a manufactured home that is posted with a prohibited sale or lease notice.

(3) A prohibited sale or lease notice shall remain posted until the code violation is corrected, we inspect and approve the correction, and you pay the required fees. (See WAC 296-150M-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0050, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0060 Who handles consumer complaints about manufactured homes? The Washington state department of community, trade and economic development (CTED), office of manufactured housing section, handles consumer complaints about manufactured homes. CTED is the state administrative agency (SAA) for the United States Department of Housing and Urban Development for the federal manufactured home program.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0060, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0100 What happens if I disagree with your decision regarding my compliance with the federal standards, ANSI, or this chapter? (1) If we determine that you are in violation with the federal standards, ANSI A225.1, or this chapter, you will receive a notice of noncompliance.

(2) If you disagree with our decision, you can submit a written request for a hearing, stating why you disagree.

(3) After we receive your hearing request, we will:

(a) Schedule a hearing within thirty days after we receive your request.

(b) Notify you of the time, date, and place for the hearing. If you fail to appear, your case will be dismissed.

(c) Hear your case.

(d) Send you written notice of our decision.

If you disagree with our decision, you may appeal it under the Administrative Procedure Act (chapter 34.05 RCW).

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150M-0100, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0100, filed 10/23/96, effective 11/25/96.]

INSIGNIA

WAC 296-150M-0200 What labels or insignia are required on my manufactured home? (1) A HUD label must be attached to the exterior of each section of a manufactured home built on or after June 15, 1976.

(2) An alteration insignia must be attached to the exterior of a manufactured home. It should be placed next to the HUD label or to the Washington state insignia.

(3) If your manufactured home does not have a HUD label or a Washington state insignia, we will attach the alteration insignia to the exterior end wall opposite the hitch end of the manufactured home. It must be placed approximately one foot above the floor line and one foot from the edge of the manufactured home.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0200, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0250 How do I replace a lost or damaged insignia? (1) If an alteration insignia or a Washington state insignia is lost or damaged after it is placed on a

manufactured home, you should notify us in writing immediately. You should provide the following information:

- (a) Your name, address, and telephone number;
 - (b) The name and address of the previous owner and date of approval, if you are replacing an alteration insignia that was obtained before you purchased the manufactured home;
 - (c) The vehicle identification number or serial number and model;
 - (d) The insignia or label number if available;
 - (e) The design plan approval number, if available; and
 - (f) The insignia replacement fee and any inspection fees.
- (See WAC 296-150M-3000.)

Note: Washington state insignia (not HUD insignia) were attached to manufactured homes prior to June 15, 1976.

(2) After we receive your notice and payment for replacing the insignia, we may inspect your manufactured home to assure that the replacement insignia reflects compliance with your original insignia.

(3) If your home complies with your original insignia approval, we will attach a replacement alteration insignia or Washington state insignia to your manufactured home.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0250, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0260 How do I replace a lost or damaged HUD label? (1) If a HUD label is lost or damaged after it is placed on a manufactured home, you should notify the manufacturer's production Inspection Primary Inspection Agency (IPIA) in writing immediately. The department of labor and industries is the IPIA for builders of manufactured homes in Washington state.

(2) If your manufactured home complies with federal standards that were in effect the date your home was built, the IPIA may replace your lost or damaged HUD label.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0260, filed 10/23/96, effective 11/25/96.]

ALTERATIONS AND INSPECTIONS

ALTERATION APPROVAL

WAC 296-150M-0300 What approval do I need to alter a manufactured home? If you alter a manufactured home in Washington state, you must obtain our approval prior to making an alteration. This includes:

- (1) Alterations made by an owner, or contractor; and
- (2) Alterations made by a dealer after a manufactured home is sold.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0300, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0306 What codes are used when altering a manufactured (mobile) home? Alterations to a manufactured (mobile) home must be in compliance with the Manufactured Home Construction and Safety Standards, Part 24, CFR 3280, as adopted by the Secretary for the Department of Housing and Urban Development (HUD) and the

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amendments to that federal standard adopted in this WAC chapter.

(1) The department will accept mix and match air conditioning/heat pump components that have been tested and listed for use with a particular furnace by a nationally recognized testing laboratory.

(2) The department will accept pellet stoves for installation that have been listed by a department approved testing laboratory. For a current list of approved laboratories, contact any department field office or the department at the address shown in WAC 296-150M-0020.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150M-0306, filed 6/30/98, effective 7/31/98.]

WAC 296-150M-0307 How may I obtain a copy of the Manufactured Home Construction and Safety Standards, Part 24, CFR 3280? Copies of the federal standard may be obtained by writing to:

Director
 Manufactured Housing Standards Division
 Department of Housing and Urban Development
 451 Seventh Street Southwest
 Washington, D.C. 20410

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150M-0307, filed 6/30/98, effective 7/31/98.]

WAC 296-150M-0310 What happens if I fail to get your approval prior to altering a manufactured home?

(1) If you alter a manufactured home without getting our approval and an alteration insignia, your manufactured (mobile) home cannot be sold or leased.

(2) We may remove any Washington state insignia(s) attached to your manufactured (mobile) home.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150M-0310, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0310, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0320 What must I provide to request approval of an alteration? (1) For approval of an alteration, you must complete and return our alteration permit application form. The application must contain:

- (a) A description of the proposed alteration(s);
- (b) Applicable specifications, engineering data, test procedures and results; and
- (c) Payment of the alteration permit fee, alteration insignia fee, and any inspection fees. (See WAC 296-150M-3000.)

(2) For approval of a structural alteration, we must approve the design plan. This is in addition to the requirements stated in subsection (1) of this section. (See WAC 296-150M-0370.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0320, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0330 How do I obtain alteration insignia information and the forms you require? Upon request, we will provide you with the forms and the fee schedules needed to obtain an alteration insignia or you can

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contact any department of labor and industries office for the forms. Our address is noted in the definition of department.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0330, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0331 Does my alteration permit expire? Yes, your alteration permit will expire one year after the date of purchase. Alteration permits purchased prior to January 1, 1998, will expire on December 31, 1998. Alteration permits purchased after January 1, 1998, will expire one year after the date of purchase.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150M-0331, filed 6/30/98, effective 7/31/98.]

WAC 296-150M-0340 What must an engineering analysis for design plans include? (1) The engineering analysis must show that the structural design meets the requirements of this chapter.

(2) An engineering analysis must be conducted according to accepted engineering practices and must be signed by a professional engineer or architect licensed in Washington or by a DAPIA who approved the original design plan.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0340, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0350 What must the test procedures and results for design plans include? (1) Tests to an alteration design must be performed and evaluated by a professional engineer or architect licensed in Washington or by a DAPIA who approved the original design plan.

(2) Test reports must contain the following items:

- (a) A description of the methods or standards that applied to the test;
- (b) Drawings and a description of the item tested;
- (c) A description of the test set-up;
- (d) The procedure used to verify the correct load;
- (e) The procedure used to measure each condition;
- (f) Test data, including applicable graphs and observations of the characteristics and behavior of the item tested;
- (g) Engineering data; and
- (h) Analysis, comments, and conclusion.

(3) The written test procedures, results, and conclusions must reference the applicable structural alteration design plan.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0350, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0360 When is design plan approval required for an alteration? (1) Design plan approval is required when you make a structural alteration to your manufactured home.

(2) A structural alteration is a change to the body or frame of a manufactured home. For example:

- (a) An alteration is made if you change the size of a room or the pitch of a roof on your manufactured home.
- (b) Any addition such as a carport that adds structural load to the manufactured home and is not fully self-supporting is an alteration.

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[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0360, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0370 How do I obtain alteration design plan approval? (1) You must have your design plan approved by:

- (a) A Design Approval Primary Inspection Agency (DAPIA), if they approved the initial design plan; or
- (b) A professional engineer or architect who is licensed in Washington state.

(2) You must submit two copies of your alteration design plan with the appropriate fee to us for review and approval. (See WAC 296-150M-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0370, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0380 How will I know whether you have approved my design plan? (1) Your design plan will be approved if it meets the requirements of this chapter and federal standards in 24 CFR 3280.

(2) We will send you an approved copy of your design plan with the plan approval number.

(3) If your design plan is not approved, you will be notified in writing of plan deficiencies. You may send a corrected design plan to us. (See WAC 296-150M-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0380, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0390 If my design plan is not approved, how much time do I have to submit a corrected plan? (1) You have ninety days to correct and resubmit your original design plan and send us the resubmittal fee after we notify you of plan deficiencies. After ninety days, your initial design plan is returned to you.

(2) If you submit your corrected design plan after ninety days, you must send the initial design plan fee instead of the resubmittal fee. (See WAC 296-150M-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0390, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0400 How do I apply for alteration approval and obtain an alteration insignia? (1) To apply for alteration approval and the alteration insignia, you must:

(a) Complete an alteration permit form and an application for alteration insignia. We will provide the forms upon request.

(b) Submit the completed forms to us, with the first hour of inspection fee and alteration insignia fee. Alterations requiring more than one inspection shall have the first hour inspection fee paid to the department prior to any inspection. (See WAC 296-150M-3000.)

(2) Request inspection of your alteration at least five days before the date you want the inspection.

(3) Once we approve your alteration, we will attach the alteration insignia to your manufactured home.

Note: Specifications, engineering data, and test results should be available for our inspector. If applicable, your approved design plan must also be available during the inspection.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150M-0400, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0400, filed 10/23/96, effective 11/25/96.]

INSPECTION

WAC 296-150M-0500 When must an inspection be requested? (1) You must request an inspection by us, if you are altering a manufactured home.

(2) You must request an inspection by the local enforcement agency, for manufactured home installations.

(3) The installation of manufactured homes must be enforced and fees charged by the counties and cities in the same manner the State Building Code is enforced under RCW 19.27.050.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0500, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0530 Am I charged if I request an inspection but am not prepared when you arrive? If you ask us to inspect your manufactured home or your alteration, but you are not prepared when we arrive, you must pay the minimum inspection fee. (See WAC 296-150M-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0530, filed 10/23/96, effective 11/25/96.]

INSTALLATION REQUIREMENTS

INSTALLATION, PERMIT, INSPECTION, DISPUTE

WAC 296-150M-0600 Who establishes standards for installation of manufactured homes? (1) The director of labor and industries is responsible for establishing uniform installation standards where possible and practical for persons or entities engaged in performing the installation of manufactured homes within the state.

(2) Local jurisdictions may adopt additional installation requirements only for those installation situations not covered by federal standards. For example, local jurisdictions may impose noise control construction ordinances, prescribe the frost depth and soil bearing capacity at the installation site, and adopt requirements to protect manufactured homes in hazardous areas, i.e., in flood and earthquake areas (see WAC 296-150M-0620).

Also, local jurisdictions may impose their requirements for snow and wind loads as long as all structures within their jurisdiction are required to comply with the same standard and provided those installing the manufactured home are given options in satisfying that standard. Such an option might include, but not be limited to, allowing an installer to erect an additional structure, which meets local standards, and protects the manufactured home. For example, an installer could erect a free standing ramada over a manufactured home to protect it from local snow loads.

Local jurisdictions **may not**:

(a) Dictate foundation construction which is built according to either the manufacturer's installation instructions or a design created by an engineer or architect licensed in Washington state.

(b) Impose regulations on smoke detectors because they are regulated by federal standards.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150M-0600, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0600, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0610 What instructions are used for a manufactured home installation? The following instructions must be used for an initial or relocated manufactured home installation (note: The specific instructions in this chapter take precedence over manufacturer's instructions and ANSI standards):

(1) Installation of a new manufactured home.

(a) The initial manufactured home installation must be conducted according to the manufacturer's instructions.

(b) If the manufacturer's instructions do not address an aspect of the installation, you may request:

(i) Specific instructions from the manufacturer; or

(ii) Specific instructions from a professional engineer or architect licensed in Washington state.

For example:

(A) A manufactured home is installed over a basement and the manufacturer's instructions do not address this application;

(B) A manufactured home is installed on a site where the specific soil bearing capacity is not addressed in the manufacturer's instructions.

(c) All manufactured homes installed in Washington state must be permanently anchored except for those installed on dealer lots. On dealer lots, temporary sets are permitted without anchoring being installed. A manufactured home must be anchored according to the manufacturer's installation instructions or according to the design of a professional engineer or architect licensed in Washington state. Local jurisdictions **may not** prescribe anchoring methods.

(d) A manufactured home must have a skirting around its entire perimeter. It must be installed per the manufacturer's installation instructions or if the manufacturer is not specific, to the standards in this section. It must be vented and allow access to the under floor area per the manufacturer's installation instructions or per the standards below if the manufacturer's instructions are not available.

If the manufacturer's skirting and access instructions are not specific, skirting, ventilation and access shall be installed as follows:

(i) Skirting:

- Skirting must be made of materials suitable for ground contact.
- Metal fasteners must be made of galvanized, stainless steel or other corrosion resistant material.
- Ferrous metal members in contact with the earth, except those made of galvanized or stainless steel, must be coated with an asphaltic emulsion.
- Skirting must not trap water between the skirting and siding or trim.
- All skirting must be recessed behind the siding or trim.

(ii) Ventilation:

For homes sited in a flood plain, contact the local jurisdiction regarding proper skirting ventilation. Except for those

manufactured homes sited in a flood plain, all skirting must be vented as follows:

- Vent openings must be covered with corrosion-resistant wire mesh to prevent the entrance of rodents. The size of the mesh opening cannot exceed 1/4 inch.
- Vent openings must have a net area of not less than one square foot for each one hundred fifty square feet of under floor area.
- Vent openings must be located as close to corners and high as practical and they must provide cross ventilation on at least two opposite sides.

(iii) Access:

- Access to the under floor area of a manufactured home must have a finished opening at least eighteen inches by twenty-four inches in size.
- The access opening must be located so that all areas under a manufactured home are available for inspection.
- The access opening must be covered and that cover must be made of metal, pressure treated wood or vinyl.

(e) A manufactured home site must be prepared per the manufacturer's installation manual or per ANSI A225.1, 1994 edition, section 3.

(f) Heat duct crossovers must be installed per the manufacturer's installation instruction manual or per ANSI A225.1 or the following instructions if the manufacturer's instructions are not available:

Heat duct crossovers must be supported at least one inch above the ground by strapping or blocking. They must be installed to avoid standing water. Also, they must be installed to prevent compression, sharp bends and to minimize stress at the connections.

(g) Dryer vents must exhaust to the exterior side of the wall or skirting. Dryer ducts outside the manufactured home shall comply with the dryer manufacturer's specifications or shall be made of metal with smooth interior surfaces.

(h) Hot water tank pressure relief lines must exhaust to the exterior side of the exterior wall or skirting and must exhaust downward. The end of the pipe must be at least six inches but not more than two feet above the ground.

(i) Water piping must be protected against freezing as per the manufacturer's installation instructions or by use of a heat tape listed for use with manufactured homes and installed per the heat tape manufacturer's installation instructions.

(j) The testing of water lines, waste lines, gas lines and electrical systems must be as per the manufacturer's installation instructions. If the manufacturer's installation instructions require testing of any of these systems, the local jurisdiction is responsible for verifying that the tests have been performed and passed. Electrical connections and testing are the responsibility of the electrical section of labor and industries except where a city has assumed the electrical inspection responsibilities for their jurisdiction. In that case, the city's electrical inspectors are responsible for the electrical connections and testing.

(k) During the installation process, a ground cover must be installed under all manufactured homes. The ground cover must be a minimum of six-mil *black* polyethylene sheeting or its equivalent (exception to ANSI A225.1 (3.5.2)). The

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ground cover may be omitted if the under floor area of the home has a concrete slab floor with a minimum thickness of three and one-half inches.

(l) Clearances underneath manufactured homes must be maintained at a minimum of eighteen inches beneath at least seventy-five percent of the lowest member of the main frame (I-beam or channel beam) and the ground or footing. No more than twenty-five percent of the lowest member of the main frame of the home shall be less than eighteen inches above the ground or footing. **In no case** shall clearance be less than twelve inches **anywhere** under the home (exception to ANSI A225.1 (4.1.3.3)).

(m) Heat pump and air conditioning condensation lines must be extended to the exterior of the manufactured home.

(2) Installation of a relocated manufactured (mobile) home.

(a) A relocated manufactured home installation should be conducted according to the manufacturer's installation instructions.

(b) If the manufacturer's instructions are unavailable, you may use either:

(i) The American National Standard Institute (ANSI) standard ANSI A225.1-Manufactured Homes Installation, 1994 edition instructions; or

(ii) The instructions of a professional engineer or architect licensed in Washington state.

(c) If either (b)(i) or (ii) is used, all of the requirements of WAC 296-150M-0610 (1)(c) through (m) must also be followed.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150M-0610, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0610, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0620 Do local enforcement agencies have special requirements for installing manufactured homes in hazardous areas? (1) Local enforcement agencies may have special installation requirements for manufactured homes installed in hazardous areas.

(2) A hazardous area is:

(a) An area recognized as a flood plain by the local jurisdiction; or

(b) An area considered hazardous due to the probability of earthquake. In such areas, local jurisdictions may require an earthquake resistant bracing system designed for the earthquake zone in which the home is located by the home manufacturer or by a registered professional engineer or architect.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150M-0620, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0620, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0630 Who may install a manufactured home? (1) A manufactured home may be installed by:

- A homeowner;
- A certified installer;
- An individual who is supervised by an on-site certified installer; or
- A specialty trades person, for certain aspects of installation.

(2) A certified installer must be a registered contractor or his or her employee, or an employee of a registered dealer-

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ship. (See chapter 43.63B RCW for details to which aspects of installation require the presence of a certified installer.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0630, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0640 Does a person who installs a manufactured home need an installation permit? (1) Any person who installs a manufactured home must obtain an installation permit from the local enforcement agency prior to installation.

(2) Any permit fees set by the local enforcement agency must be paid in full and included with the permit application.

(3) A dealer, owner or agent must not deliver a manufactured home to its site without verifying that an installation permit has been obtained.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150M-0640, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0640, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0650 Does a manufactured home installation require an inspection? All manufactured home installations must be inspected and approved by the local enforcement agency.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0650, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0660 What are the requirements for on-site structures and who regulates them? On-site structures, sometimes referred to as auxiliary structures, such as, but not limited to, carports, decks and steps should be self-supporting.

(1) Local enforcement agency jurisdiction.

(a) On-site self-supporting structures that do not use any of the systems in the manufactured home are inspected by the local enforcement agency and they should be contacted for specific on-site structure requirements.

(b) Awnings and carports that are self-supported by a beam next to a manufactured (mobile) home are inspected by the local enforcement agency. Note: The awning or carport may be flashed to the manufactured (mobile) home.

(2) Department of labor and industries jurisdiction.

(a) On-site structures that are not self-supporting or use one or more of the systems of the manufactured home require an inspection by us and by the local enforcement agency.

(b) Awnings and carports that are attached to the manufactured (mobile) home without the benefit of a self-supported beam require approval and inspection by the department. Note: This attachment must be designed and approved by an engineer or an architect licensed in Washington state. Furthermore, these stamped plans must be submitted to the department and approved before an inspection can be conducted.

(c) Attached garages:

(i) If the manufactured (mobile) home is built "garage ready" (one hour fire wall, dormer, etc.) at the factory **and** is installed by the manufacturer, an alteration inspection may not be required.

(ii) If the manufactured (mobile) home is not built "garage ready" at the factory, an alteration inspection is required for all changes made to it.

[Statutory Authority: Chapter 43.22 RCW. 98-14-078, § 296-150M-0660, filed 6/30/98, effective 7/31/98. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0660, filed 10/23/96, effective 11/25/96.]

WAC 296-150M-0670 What happens if a dispute arises concerning an installation requirement? (1) If a dispute arises between any person, business, or local enforcement agency concerning an installation requirement of ANSI A225.1 or this chapter, the issue may be submitted to the factory assembled structures advisory (FAS) board.

(2) The board may provide an opinion on the requirement.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150M-0670, filed 10/23/96, effective 11/25/96.]

MANUFACTURED HOME FEES

WAC 296-150M-3000 Manufactured home fees.

WAC 296-150M-3000 MANUFACTURED HOME FEES	
INITIAL FILING FEE	\$27.00
DESIGN PLAN FEES:	
STRUCTURAL ALTERATION-MASTER DESIGN (CODE CYCLE)	\$108.25
STRUCTURAL ALTERATION-ONE YEAR DESIGN	\$75.75
RENEWAL FEE	\$32.50
RESUBMITAL	\$54.00
ADDENDUM	\$54.00
DEPARTMENT INSPECTION FEES:	
INSPECTION (Per hour*)	\$54.00
OTHER REQUIRED INSPECTIONS (Per hour*)	\$54.00
ALL REINSPECTIONS (Per hour*)	\$54.00
INSIGNIA FEES:	
ALTERATION	\$27.00
REISSUED-LOST/DAMAGED	\$16.00
IPIA	
DEPARTMENT AUDIT FEES	
REGULARLY SCHEDULED IPIA AUDIT:	
First inspection on each section (one time only)	\$24.75
Second and succeeding inspections of unlabelled sections (Per hour* plus travel time* and mileage**)	\$54.00
OTHER IPIA FEES:	
Red tag removal during a regularly scheduled IPIA audit (Per hour* separate from other fees)	\$54.00
Red tag removal at a time other than a regularly scheduled IPIA audit (Per hour* plus travel time* and mileage**)	\$54.00
Increased frequency surveillance (Per hour* plus travel time* and mileage**)	\$54.00
Attendance at manufacturers training classes (Per hour* only)	\$54.00
Subpart "I" investigations (Per hour* plus travel time* and mileage**)	\$54.00
Alterations to a labelled unit (Per hour* plus travel time* and mileage**)	\$54.00
IPIA Issues/Responses (Per hour* plus travel time* and mileage**)	\$54.00
Monthly surveillance during a regularly scheduled IPIA audit (Per hour* plus travel time* and mileage**)	\$54.00
Monthly surveillance at a time other than a regularly scheduled IPIA audit (Per hour* plus travel time* and mileage**)	\$54.00
Plant certifications, recertifications and addenda updates (Per hour* plus travel time* and mileage** per each inspector)	\$54.00
Response to HBT Audit during a regularly scheduled IPIA audit (Per hour*)	\$54.00
Response to HBT Audit at a time other than a regularly scheduled IPIA audit (Per hour* plus travel time* and mileage**)	\$54.00
Alternative construction (AC) letter inspections at placement site (Per hour* plus travel time* and mileage**)	\$54.00
Replacement of HUD labels (Per hour* plus travel time* and mileage**)	\$54.00
OTHER FEES:	
FIELD TECHNICAL SERVICE (Per hour* plus travel time* and mileage**)	\$54.00
PUBLICATION PRINTING AND DISTRIBUTION OF RCW'S AND WAC'S (One free copy per year)	\$10.50
NOTE: Local jurisdictions may have other fees that apply.	
* Minimum charge of 1 hour; time spent greater than 1 hour is charged in 1/2 hour increments.	
** Per state guidelines.	
*** Actual charges incurred.	

[Statutory Authority: Chapters 18.106, 18.27 and 43.22 RCW, 98-12-041, § 296-150M-3000, filed 5/29/98, effective 6/30/98. Statutory Authority: RCW 70.87.030, 18.27.070, [18.27.]075, 43.22.350, [43.22.]355, [43.22.]434 and [43.22.]480(2), 97-11-053, § 296-150M-3000, filed 5/20/97, effective 6/30/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480, 96-21-146, § 296-150M-3000, filed 10/23/96, effective 11/25/96.]

**Chapter 296-150P WAC
RECREATIONAL PARK TRAILERS**

WAC
296-150P-0010
296-150P-0020
296-150P-0030
296-150P-0040

Authority, purpose, and scope.
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296-150P-0340	What happens if you approve my design plan?
296-150P-0350	If my design plan is not approved, how much time do I have to submit a correct plan?

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DESIGN PLAN/QUALITY CONTROL MANUAL—REVIEW, CHANGE/ADDENDUM, EXPIRATION, AND RENEWAL

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296-150P-0620	What happens if my recreational park trailer passes inspection?
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LOSS OF STATE-PLAN APPROVAL

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RECREATIONAL PARK TRAILER ALTERATIONS

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MANUFACTURER'S NOTICE TO THE DEPARTMENT

296-150P-2000	Must state-plan manufacturers notify you if they manufacture at more than one location?
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296-150P-2010	Must state-plan manufacturers notify you if they change a business name or address?
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296-150P-2030	Must state-plan manufacturers notify you of their Washington dealers?

RECREATIONAL PARK TRAILER FEES

296-150P-3000	Recreational park trailer fees.
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WAC 296-150P-0010 Authority, purpose, and scope.

(1) This chapter is authorized by RCW 43.22.335 through 43.22.434 and covers the requirements for:

(a) Obtaining state-plan status if you manufacture recreational park trailers for sale or lease in Washington state.

(b) Obtaining state-plan insignia if you manufacture recreational park trailers for sale or lease in Washington state.

(2) This chapter applies to:

(a) Manufacturers, dealers and individuals who build for sale, sell, or lease recreational park trailers in Washington state; and

(b) Manufacturers, dealers, and individuals who alter recreational park trailers for sale or lease in Washington state.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0010, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0020 What definitions apply to this chapter? "Alteration" is the replacement, addition, modification, or removal of any equipment or material that affects the fire and life safety provisions, structural system, plumbing systems, fuel systems and equipment or electrical systems of a recreational park trailer.

The following changes are not considered alterations for purposes of this chapter:

- Repairs with approved parts;
- Modification of a fuel-burning appliance according to the terms of its listing; and
- Adjustment and maintenance of equipment.

"**Alteration insignia**" is an insignia which indicates a recreational park trailer alteration was approved by the department.

"**ANSI**" is the American National Standards Institute, Inc., and the institute's rules applicable to recreational park trailers. For the purposes of this chapter, references to ANSI mean ANSI A119.5 Recreational Park Trailers, 1997 edition.

"**Approved**" is approved by the department of labor and industries.

"**Audit**" by the department is the department inspection of a manufacturer's quality control procedures, comprehensive plans, and recreational park trailers.

"**Comprehensive design plan**" consists of the design plans and copies of drawings such as:

- Floor plans relating to fire and life safety, structural, electrical, plumbing, liquefied petroleum (LP) and/or natural gas systems and appliances and air conditioning systems, if applicable to the plan of each recreational park trailer.

- Plumbing line drawings which describe the size, length and location of gas piping lines, liquid and body waste lines, liquid and body waste tanks, and potable water tanks.

- Electrical drawings. (See WAC 296-150P-0330.)

"**Consumer**" is a person or organization who buys or leases recreational park trailers.

"Dealer" is a person or organization whose business is offering recreational park trailers for sale or lease.

"Department" is the department of labor and industries. The department may be referred to as "we" or "us" in this chapter. Note: You may contact us at: Department of Labor and Industries, Specialty Compliance, PO Box 44430, Olympia, WA 98504-4430.

"Equipment" is all material, appliances, fixtures, and accessories used in the manufacture or alteration of recreational park trailers.

"Manual" is a reference containing instructions, procedures, responsibilities and other information used to implement and maintain the quality control program of a recreational park trailer manufacturer.

"National Electrical Code" 1996 edition is the electrical code required for ANSI A119.5 compliance.

"Recreational park trailer" is a trailer-type unit that is primarily designed to provide temporary living quarters for recreational, camping or seasonal use, that meets the following criteria:

- Built on a single chassis, mounted on wheels;
- Having a gross trailer area not exceeding 400 square feet (37.15 square meters) in the set-up mode; and
- Certified by the manufacturer as complying with ANSI A119.5.

"Quality control" is the plan and method for ensuring that the manufacture, fabrication, assembly, installation, storing, handling, and use of materials complies with this chapter and ANSI.

"State-plan insignia" is an insignia which is obtained under the state design-plan approval process.

"System" is a part of a recreational park trailer that is designed to serve a particular function such as plumbing, electrical, heating, mechanical or structural system.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0020, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0030 How is this chapter enforced?

(1) We enforce this chapter through the state-plan insignia approval process (see WAC 296-150P-0300 through 296-150P-0720).

(2) Recreational park trailer inspections occur where the recreational park trailers are manufactured, sold, or leased. We conduct inspections during normal work hours or at other reasonable times. We may require you to remove a part of the recreational park trailer in order to conduct our inspection.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0030, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0040 Will you keep my manufacturing information confidential? We will only release manufacturing information, such as design plans, specifications, test results, and manuals, according to the Public Records Act (see RCW 42.17.310 (1)(h)) unless we are ordered to do so by a court or otherwise required by law.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0040, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0060 Who handles consumer complaints about recreational park trailers? (1) Consumers

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may file complaints with us, if they have reason to believe a manufacturer and/or dealer is in violation of this chapter and ANSI.

(2) The complaint should be in writing and describe the items that may not comply with this chapter and ANSI.

(3) After we receive the complaint, we will send the manufacturer and/or the dealer a copy of the complaint. The manufacturer and/or dealer has thirty days to respond to the complaint.

(4) If we decide an inspection is warranted and specific code violation(s) are found during the inspection, the manufacturer or dealer is charged for the inspection.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0060, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0100 What happens if I disagree with the department's decision regarding my compliance with this chapter and ANSI? (1) If we determine that you are in violation of this chapter and ANSI, you will receive a notice of noncompliance and we may withdraw your certification. (See WAC 296-150P-0710.)

(2) If you disagree with our decision, you can send us a written request for a hearing, stating why you disagree.

(3) After we receive your hearing request, we will:

(a) Schedule a hearing within thirty days after we receive your request.

(b) Notify you of the time, date, and place for the hearing. If you fail to appear, your case will be dismissed.

(c) Hear your case.

(d) Send you written notice of our decision.

If you disagree with our decision, you may appeal it under the Administrative Procedure Act (chapter 34.05 RCW).

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0100, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0110 Do you have an advisory board to address recreational park trailer issues? The factory assembled structures (FAS) board advises us on issues relating to plumbing, heating, electrical, installation, alterations, inspections, and rules for recreational park trailers. (See RCW 43.22.420.)

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0110, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0120 Where can I obtain technical assistance regarding recreational park trailers? We provide field technical service to recreational park trailer manufacturers for an hourly fee (see WAC 296-150P-3000). Field technical service may include an evaluation, consultation, plan examination, interpretation, and clarification of technical data relating to the application of our rules. It does not include inspections.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0120, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0130 Do you allow recreational park trailers to be displayed without an insignia? We allow one recreational park trailer to be displayed without an insignia, if you:

(1) Get written approval from us in advance of displaying the unit; we should receive your written request at least thirty days prior to display of the unit. Your request must include:

- (a) The model and serial number of the unit;
 - (b) The location where the unit will be displayed; and
 - (c) The date(s) the unit will be displayed.
- (2) Are licensed in Washington state through the department of licensing;
- (3) Have your approval letter available at the display;
 - (4) Place three visible signs on the display unit:
 - (a) One at the main entry door;
 - (b) One inside the front of the unit; and
 - (c) One inside the back of the unit.

The signs must read: NOT FOR SALE - DISPLAY ONLY.

The letters on the sign must be one inch or higher.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0130, filed 7/31/97, effective 12/1/97.]

REQUIREMENTS FOR INSIGNIA AND OTHER IDENTIFICATION

WAC 296-150P-0200 Who should obtain recreational park trailer insignia? (1) If you manufacture recreational park trailers to be sold or leased in Washington, you must purchase a state-plan insignia for each recreational park trailer.

(2) Individuals that build recreational park trailers to sell or lease in Washington must purchase an insignia.

(3) If you have a recreational park trailer with a state-plan insignia and you plan to alter or have another person alter it, you must obtain an alteration insignia from us.

Note: You do not need to purchase our insignia if you manufacture recreational park trailers in Washington for sale outside the state.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0200, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0210 How do I obtain insignia information and the forms you require? Upon request, we will provide you with a packet of information that includes required forms and fee schedule for obtaining the state-plan insignia. Our address is noted in the definition of department.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0210, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0220 How do I obtain insignia based on state-plan approval? (1) If you are approved to purchase insignia based on state-plan approval, you may purchase the insignia by submitting the insignia application with the required fees. (See WAC 296-150P-3000.)

(2) The application must include:

- (a) A signed statement from you certifying that you are manufacturing your units according to your approved design plans and your quality control program; and
- (b) A list of the approved design plans against which you will apply the insignia.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0220, filed 7/31/97, effective 12/1/97.]

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WAC 296-150P-0250 How do I replace lost or damaged insignia? (1) If an insignia is lost or damaged after it is placed on a recreational park trailer and you are the manufacturer or owner, you must notify us in writing immediately.

(2) Your notification should include the following information:

- (a) Your name, address, and telephone number;
- (b) The recreational park trailer serial number;
- (c) The insignia number and design-plan approval number, if applicable; and
- (d) The required fee. (See WAC 296-150P-3000.)

(3) If we can determine that your unit previously had an insignia, we will attach the insignia to your recreational park trailer once we receive your insignia fee. (See WAC 296-150P-3000.)

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0250, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0280 What other identification is required? Every new recreational park trailer manufactured, offered for sale or lease, or sold or leased in Washington must also have a vehicle identification number (VIN) label in compliance with the Federal Department of Transportation (DOT) safety standards.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0280, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0290 When and where should the insignia and the identification label be attached to the recreational park trailer? (1) Insignia must be attached to the finished recreational park trailer before it leaves the approved manufacturer's location.

(2) The state-plan insignia must be attached adjacent to the main door, on the strike side of the door, at least twelve inches above the floor line. The strike side of the door is opposite the hinge side of the door.

(3) The alteration insignia must be attached next to the certification insignia.

(4) The identification number (VIN) label must be attached on the recreational park trailer as required by the Federal Department of Transportation. Any other identification label must be attached next to the certification insignia or on the exterior front half of the left side of the recreational park trailer, at least six inches above the floor line.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0290, filed 7/31/97, effective 12/1/97.]

STATE PLAN

WAC 296-150P-0300 What is required to obtain insignia based on state-plan approval? If you want to obtain insignia based on state-plan approval, you must:

- (1) Have your design plan and quality control manual approved by us; and
- (2) Pass a quality control program audit which includes a random inspection of your recreational park trailers.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0300, filed 7/31/97, effective 12/1/97.]

(1999 Ed.)

WAC 296-150P-0310 What is required after I am approved as a state-plan manufacturer? Once you have obtained approval as a state-plan manufacturer:

- (1) You are required to submit comprehensive design plans to us for approval;
- (2) You can inspect your own recreational park trailer based upon your quality control manual specifications; and
- (3) You are subject to a semiannual audit at your manufacturing location(s).

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0310, filed 7/31/97, effective 12/1/97.]

DESIGN PLAN

WAC 296-150P-0320 How do I apply for design-plan approval? Upon request, we will send you a design-plan approval request form.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0320, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0330 What is required for comprehensive design-plan approval? If you are the manufacturer applying for state-plan approval:

(1) You must submit two sets of comprehensive design plans (do not send originals) to us for approval. Design plans must be accompanied by the initial filing fee, if appropriate, and the design-plan fee. (See WAC 296-150P-3000.)

(2) Your comprehensive design plan must indicate compliance with the appropriate ANSI standards in the following plans and drawings:

(a) Floor plans relating to fire and life safety, electrical, plumbing, liquefied petroleum (LP) and/or natural gas systems and appliances, and air conditioning systems, if applicable, of each recreational park trailer.

(b) Plumbing line drawings which describe the size, length and location of gas piping lines, liquid and body waste lines, liquid and body waste tanks, and potable water tanks.

(c) Electrical drawings.

(d) Structural drawings showing compliance with ANSI A119.5, Chapter 5.

Note: We will provide a check list with detailed requirements for each type of plan upon request.

(3) Current comprehensive design plans must be available at each manufacturing location.

(4) You must have an approved quality control manual. (See WAC 296-150P-0400, 296-150P-0410.)

Note: You do not need a quality control manual if you are an individual asking us to inspect a recreational park trailer.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0330, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0340 What happens if you approve my design plan? (1) Your design plan will be approved if it complies with the requirements of this chapter and ANSI.

(2) We will send you an approved copy of the design plan with the approval number.

(3) You must keep copies of the approved design plan for all models produced at the manufacturing location.

(4) If your design plan is not approved, you will be notified in writing of plan deficiencies. You may send a corrected design plan to us.

(1999 Ed.)

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0340, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0350 If my design plan is not approved, how much time do I have to submit a correct plan? (1) You have ninety days to correct and resubmit your original design plan and send us the resubmittal fee once we notify you of plan deficiencies. After ninety days, your initial design plan is returned to you.

(2) If you submit your corrected design plan after ninety days, you must send the initial design-plan fee instead of the resubmittal fee. (See WAC 296-150R-3000.)

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0350, filed 7/31/97, effective 12/1/97.]

QUALITY CONTROL PROGRAM/MANUAL

WAC 296-150P-0400 What constitutes an acceptable quality control program/manual for state-plan insignia? Your quality control program must implement your approved quality control manual. The quality control manual must provide instructions, procedures, and assign responsibilities to assure quality control requirements are met when the recreational park trailers are manufactured. The minimum quality control manual requirements are:

(1) An organization chart which identifies quality assurance positions and describes quality control responsibilities and accountability for the following plant personnel: General manager, plant production manager, plant foreperson, lead persons, production, quality control, sales, engineering, purchasing, and receiving staff;

(2) A method to distribute all comprehensive design plans and installation instructions or other documentation that ensures all products used are installed correctly in all recreational park trailer models produced at each manufacturing location;

(3) Procedures for maintaining the quality assurance of each recreational park trailer model;

(4) Drawings and procedures displaying manufacturing processes including a schematic plant layout;

(5) Descriptions of production stations, including surge-hold stations, on-site or off-site repair-rework locations, and off-line construction sites. Descriptions should identify by station and location the work, tests, or inspections performed and the job title of the person performing the quality control review;

(6) Inspection and equipment maintenance instructions, including jig maintenance, check-off lists, and other documentation verifying quality control performance and accountability;

(7) Coordination of staff duties ensuring smooth transition of manufacturing responsibilities during the shift change;

(8) Instructions regarding the identification, control, and handling of damaged goods or materials that do not comply with existing rules and ANSI;

(9) Information about recreational park trailer material storage and environmental control including protection from the weather and the elimination of scrap and age-dated materials which have exceeded their life;

[Title 296 WAC—p. 2053]

(10) Verification that testing equipment is properly calibrated and that your gauges are accurate;

(11) Information about production line testing which includes descriptions of procedures, test equipment, and the location of each test. The information should demonstrate accountability for test completion, for rework and repair, and for retesting;

(12) Instructions, procedures, descriptions, and responsibilities for insignia storage, security, application, and inventory;

(13) Procedures for mixed production lines, for variable production rates, for new or substitute personnel, and for new or changed inspections and tests;

(14) Instructions, procedures, and responsibilities for keeping recreational park trailer records which include the unit serial number, model, plan approval number, dealer location or destination, insignia number, inspection, and test results;

(15) Information about your quality control training program; and

(16) Procedures for introducing new designs, models, materials and equipment to staff that ensures products are built according to the standards and the manufacturer's instructions.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0400, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0410 How do I apply to have my quality control manual approved? We will provide the form and instructions upon request.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0410, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0420 What happens if my quality control manual is approved? (1) Your quality control manual will be approved if it meets the requirements of this chapter and ANSI.

(2) We will send you an approved copy of your quality control manual.

(3) If your quality control manual is not approved, you will be notified in writing of the deficiencies. You may send us a corrected quality control manual.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0420, filed 7/31/97, effective 12/1/97.]

DESIGN PLAN/QUALITY CONTROL MANUAL— REVIEW, CHANGE/ADDENDUM, EXPIRATION, AND RENEWAL

WAC 296-150P-0440 Do I need approval to change my design plan or quality control manual after I receive state-plan approval? (1) Once you have received state-plan approval and you want to change your design plan or quality control manual, we must approve the changes/addenda.

(2) You should send design plan or quality control manual changes to us thirty days before you want the changes/addenda to take effect.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0440, filed 7/31/97, effective 12/1/97.]

[Title 296 WAC—p. 2054]

WAC 296-150P-0450 When does state-plan insignia approval expire? (1) As a state-plan manufacturer, your approval for insignia is based upon approval of your design plan and quality control manual. Design plans are considered approved until a new ANSI code edition is adopted or unless revisions to ANSI prior to code changes would not support our design-plan approval.

(2) If, after the new ANSI code edition is adopted, your design plan and quality control manual remain identical (you may change the model name or designation) to your original design plan, you only need to submit the new plan fee and the plan approval request. **(Do not send plans.)**

Note: ANSI codes are normally adopted for a three-year period.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0450, filed 7/31/97, effective 12/1/97.]

INSPECTION

WAC 296-150P-0600 When does a manufacturer, individual builder, or a dealer need to request a recreational park trailer inspection? If you are a manufacturer, individual builder, or a dealer, you must request a recreational park trailer inspection by us:

(1) If you have approval of your design plan and quality control manual and need to complete the state-plan process;

(2) If you are making a recreational park trailer alteration which must be inspected and approved by us; or

(3) If you are correcting a violation which must be inspected and approved by us.

Note: An individual who is building a recreational park trailer to own, sell, or lease must obtain an identification number from the state patrol prior to our issuance of certification insignia.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0600, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0610 How do I request a recreational park trailer inspection and what documentation is required? (1) Complete an inspection application which can be obtained from us.

(2) Send the completed application, application fee, and inspection fee to us prior to the date you would like an inspection performed. (See WAC 296-150P-3000.)

(3) During the inspection, have your approved design plans, specifications, and test results available for our inspector.

(4) A recreational park trailer inspection will be completed in two or more phases. The "cover" inspection during the construction of the unit before the electrical, plumbing, mechanical, heating, and structural systems are covered. The final inspection takes place after the recreational park trailer is complete.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0610, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0620 What happens if my recreational park trailer passes inspection? (1) If your recreational park trailer passes inspection and you have met the other requirements of this chapter and ANSI, you will be approved to purchase state-plan insignia from us.

(2) If you send your insignia application and fee to us prior to the inspection, we will attach your insignia when we approve the recreational park trailer.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0620, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0630 What happens if my recreational park trailer does not pass inspection? (1) If your recreational park trailer does not pass inspection, you will receive a notice of noncompliance.

(2) You have ten days after receiving the notice of noncompliance to send us a written response explaining how you will correct the violation(s) and prevent its reoccurrence.

(3) You are not allowed to move, sell or lease a recreational park trailer until:

- (a) You correct the violation(s);
- (b) We inspect and approve the correction(s); and
- (c) You pay the inspection fee and the insignia fee, if required. (See WAC 296-150P-3000.)

(4) If you fail to make the corrections, the sale or lease of your recreational park trailer is prohibited by RCW 43.22.340 until the corrections are made.

Note: You will be allowed to return a recreational park trailer to the manufacturing location or to another location for correction with our approval.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0630, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0640 Am I charged if I request an inspection but I am not prepared? (1) If you ask us to inspect recreational park trailers within Washington state but are not prepared when we arrive, you must pay the minimum inspection fee and travel.

(2) If you ask us to inspect recreational park trailers outside Washington state but are not prepared when we arrive, you must pay the minimum inspection fee, travel, and per diem expenses.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0640, filed 7/31/97, effective 12/1/97.]

AUDIT

WAC 296-150P-0700 What does our annual quality control program audit for state-plan insignia include? (1) During your annual audit for state-plan insignia, we will review your quality control program and randomly inspect your recreational park trailer.

(2) If our audit indicates that you are complying with the requirements of this chapter and ANSI, you may purchase state-plan insignia.

(3) If we discover a quality control program deficiency or a recreational park trailer violation during our audit, you will receive a notice of noncompliance and cannot purchase state-plan insignia until the deficiency or violation is corrected.

(a) You can correct the deficiency or violation during the audit; or

(b) You have fourteen days after receiving the notice of noncompliance to send us a written response explaining your correction of the deficiency or violation; and

(c) You are subject to a follow-up audit.

(1999 Ed.)

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0700, filed 7/31/97, effective 12/1/97.]

LOSS OF STATE-PLAN APPROVAL

WAC 296-150P-0710 Can you withdraw my state-plan insignia approval? Should you fail to meet the requirements of this chapter or ANSI after you have been approved to purchase state-plan insignia, we will withdraw your certification.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0710, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-0720 What happens if my state-plan insignia approval is withdrawn? If your state-plan insignia approval is withdrawn because you have failed to comply with this chapter and ANSI:

(1) You must return any issued but unused insignia to us; and

(2) You cannot sell or lease recreational park trailers in Washington.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-0720, filed 7/31/97, effective 12/1/97.]

RECREATIONAL PARK TRAILER ALTERATIONS

WAC 296-150P-1000 Who needs approval to alter a recreational park trailer? Any alteration by a manufacturer, dealer, or individual to a recreational park trailer with state-certified insignia must be approved by us before the alteration is made. "Alteration" is defined in WAC 296-150P-0020.

Note: We may remove your insignia if you alter or have someone alter a recreational park trailer without our approval.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-1000, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-1010 Must I purchase a separate insignia for an alteration? You are required to purchase an alteration insignia from us.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-1010, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-1020 How do I apply for alteration approval and obtain the alteration insignia? (1) To apply for alteration approval and the alteration insignia, you must:

(a) Complete an alteration permit form and an application for alteration insignia. We will provide the forms.

(b) Submit the completed forms, with the inspection fee and altered recreational park trailer insignia fee, to us. (See WAC 296-150P-3000.)

(2) Our recreational park trailer inspection of the alteration will be in two or more phases. The "cover" inspection during the alteration of the unit before the electrical, plumbing, mechanical, heating, structural or other systems are covered. The final inspection takes place after the alteration inspection is complete.

(3) Once we approve your alteration, we will attach the alteration insignia.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-1020, filed 7/31/97, effective 12/1/97.]

**MANUFACTURER'S NOTICE TO THE
DEPARTMENT**

WAC 296-150P-2000 Must state-plan manufacturers notify you if they manufacture at more than one location?

(1) We must approve each recreational park trailer manufacturing location producing units for sale or lease in Washington state.

(2) You must send us the following information for each manufacturing location when you are certified:

- (a) Company name;
- (b) Mailing and physical address;
- (c) Phone and FAX number if available;
- (d) Type of recreational park trailer(s) manufactured;
- (e) Contact person for plan review; and
- (f) Contact person for plant audit.

(3) You must update the information as it changes.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-2000, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-2010 Must state-plan manufacturers notify you if they change a business name or address? (1)

If you are moving your business from an approved manufacturing location, the new location must be approved before shipping units from that location for sale or lease in Washington state.

(2) You must notify us in writing prior to a change of business name or address.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-2010, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-2020 Must state-plan manufacturers notify you of a change in business ownership? (1)

When a recreational park trailer manufacturing business changes ownership, the new owner must notify us in writing immediately.

(2) A new owner may continue to manufacture recreational park trailers using approved design plans or comprehensive design plans according to this chapter.

(3) The department will perform an audit of the manufacturer after the ownership change to ensure you are meeting the requirements of this chapter and ANSI.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-2020, filed 7/31/97, effective 12/1/97.]

WAC 296-150P-2030 Must state-plan manufacturers notify you of their Washington dealers? (1)

You must send us the following information about yourself and each of your Washington dealers when you are certified:

- (a) Dealership name;
- (b) Mailing and physical address;
- (c) Phone and FAX number if available;
- (d) Type of recreational park trailer(s); and
- (e) Contact person.

(2) You must update this information as it changes.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150P-2030, filed 7/31/97, effective 12/1/97.]

RECREATIONAL PARK TRAILER FEES

[Title 296 WAC—p. 2056]

(1999 Ed.)

WAC 296-150P-3000 Recreational park trailer fees.

WAC 296-150P-3000 RECREATIONAL PARK TRAILER FEES	
INITIAL FILING FEE	\$27.00
DESIGN PLAN FEES:	
NEW PLAN REVIEW FEE WITHOUT STRUCTURAL REQUIREMENTS	\$75.75
NEW PLAN REVIEW FEE WITH STRUCTURAL REQUIREMENTS	\$100.00
RESUBMIT FEE	\$54.00
ADDENDUM	\$54.00
STATE PLAN/MANUAL FEES:	
INITIAL APPROVAL	\$10.50
RESUBMITTAL	\$54.00
ADDENDUM	\$54.00
DEPARTMENT AUDIT FEES:	
AUDIT (PER HOUR) *	\$54.00
TRAVEL (PER HOUR) *	\$54.00
PER DIEM**	
HOTEL***	
MILEAGE**	
RENTAL CAR***	
PARKING***	
AIRFARE***	
DEPARTMENT INSPECTION FEES:	
INSPECTION (PER HOUR) *	\$54.00
TRAVEL (PER HOUR) *	\$54.00
PER DIEM**	
HOTEL***	
MILEAGE**	
RENTAL CAR***	
PARKING***	
AIRFARE***	
INSIGNIA FEES:	
STATE CERTIFIED	\$10.25
ALTERATION	\$27.00
REISSUED-LOST/DAMAGED	\$10.25
OTHER FEES:	
FIELD TECHNICAL SERVICE (Per hour* plus travel time* and mileage* *.)	\$54.00
PUBLICATION PRINTING AND DISTRIBUTION OF RCW'S AND WAC'S (One free copy per year.)	\$10.50
*Minimum charge of 1 hour ; time spent greater than 1 hour is charged in 1/2 hour increments.	
**Per state guidelines.	
***Actual charges incurred.	

[Statutory Authority: Chapters 18.106, 18.27 and 43.22 RCW. 98-12-041, § 296-150P-3000, filed 5/29/98, effective 6/30/98. Statutory Authority: RCW 43.22.340 and 43.22.420, 97-16-043, § 296-150P-3000, filed 7/31/97, effective 12/1/97.]

**Chapter 296-150R WAC
RECREATIONAL VEHICLES**

WAC

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MANUFACTURER'S NOTICE TO THE DEPARTMENT

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RECREATIONAL VEHICLE AND PARK TRAILER FEES

296-150R-3000	Recreational vehicle fees.
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WAC 296-150R-0010 Authority, purpose, and scope.

(1) This chapter is authorized by RCW 43.22.335 through 43.22.434 and covers the requirements for:

(a) Obtaining state-plan or self-certified status if you manufacture recreational vehicles for sale or lease in Washington state.

(b) Obtaining state-plan or self-certified insignia if you manufacture recreational vehicles for sale or lease in Washington state.

(2) This chapter applies to:

(a) Manufacturers, dealers and individuals who build for sale, sell, or lease recreational vehicles in Washington state; and

(b) Manufacturers, dealers, and individuals who alter recreational vehicles for sale or lease in Washington state.

[Statutory Authority: RCW 43.22.340 and 43.22.420, 97-16-043, § 296-150R-0010, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0010, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0020 What definitions apply to this chapter? "Alteration" is the replacement, addition, modification, or removal of any equipment or material that affects the fire and life safety provisions, plumbing systems, fuel systems and equipment or electrical systems of a recreational vehicle.

The following changes are not considered alterations for purposes of this chapter:

- Repairs with approved parts;
- Modification of a fuel burning appliance according to the terms of its listing; and
- Adjustment and maintenance of equipment.

"Alteration insignia" is an insignia which indicates a vehicle alteration was approved by the department.

"ANSI" is the American National Standards Institute, Inc., and the institute's rules applicable to recreational vehicles. For the purposes of this chapter, references to ANSI mean ANSI A119.2 Recreational Vehicles, 1996 edition.

"Approved" is approved by the department of labor and industries.

"Audit" by the department can be either a comprehensive audit or a performance audit. A comprehensive audit is the department inspection of a manufacturer's quality control procedures, comprehensive plans, and vehicles. A performance audit is the department's review of the manufacturer's audit performed by the industry association or other independent auditor.

"Comprehensive design plan" consists of the design plans and copies of drawings such as:

- Floor plans relating to fire and life safety, electrical, plumbing, liquefied petroleum (LP) and/or natural gas systems and appliances and air conditioning systems, if applicable to the plan of each vehicle.

- Plumbing line drawings which describe the size, length and location of gas piping lines, liquid and body waste lines, liquid and body waste tanks, and potable water tanks.

- Electrical drawings. (See WAC 296-150R-0330 and 296-150R-0820.)

"Consumer" is a person or organization who buys or leases recreational vehicles.

"Dealer" is a person or organization whose business is offering recreational vehicles for sale or lease.

"Department" is the department of labor and industries. The department may be referred to as "we" or "us" in this chapter. Note: You may contact us at: Department of Labor and Industries, Specialty Compliance, PO Box 44430, Olympia, WA 98504-4430.

"Equipment" is all material, appliances, fixtures, and accessories used in the manufacture or alteration of recreational vehicles or park trailers.

"Manual" is a reference containing instructions, procedures, responsibilities and other information used to implement and maintain the quality control program of a recreational vehicle manufacturer.

"National Electrical Code" 1996 edition is the electrical code required for ANSI A119.2 compliance.

"Quality control" is the plan and method for ensuring that the manufacture, fabrication, assembly, installation, storing, handling, and use of materials complies with this chapter and ANSI.

"Recreational vehicle" is a vehicular type unit primarily designed as temporary living quarters for recreational camping, travel, or seasonal use that either has its own motive power or is mounted on, or towed by, another vehicle. Recreational vehicles include: Camping trailers, fifth-wheel trailers, motor homes, travel trailers, and truck campers.

"Self-certification insignia" is an insignia which is obtained under the self-certification approval process.

"State-plan insignia" is an insignia which is obtained under the state design-plan approval process.

"System" is a part of a recreational vehicle that is designed to serve a particular function such as plumbing, electrical, heating, or mechanical system.

"Vehicle" for the purposes of this chapter, is a recreational vehicle.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-0020, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0020, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0030 How is this chapter enforced?

(1) We enforce this chapter through:

(a) The state plan insignia approval process (see WAC 296-150R-0300 through 296-150R-0720); or

(b) The self-certification insignia approval process (see WAC 296-150R-0800 through 296-150R-0930).

(2) Vehicle inspections occur where the recreational vehicles are manufactured, sold, or leased. We conduct inspections during normal work hours or at other reasonable

times. We may require you to remove a part of the recreational vehicle in order to conduct our inspection.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-0030, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0030, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0040 Will you keep my manufacturing information confidential? We will only release manufacturing information, such as design plans, specifications, test results, and manuals, according to the Public Records Act (see RCW 42.17.310 (1)(h)) unless we are ordered to do so by a court or otherwise required by law.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-0040, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0040, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0060 Who handles consumer complaints about recreational vehicles? (1) Consumers may file complaints with us, if they have reason to believe a manufacturer and/or dealer is in violation of this chapter and ANSI.

(2) The complaint should be in writing and describe the items that may not comply with this chapter and ANSI.

(3) After we receive the complaint, we will send the manufacturer and/or the dealer a copy of the complaint. The manufacturer and/or dealer has thirty days to respond to the complaint.

(4) If we decide an inspection is warranted and specific code violation(s) are found during the inspection, the manufacturer or dealer is charged for the inspection.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-0060, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0060, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0100 What happens if I disagree with the department's decision regarding my compliance with this chapter and ANSI? (1) If we determine that you are in violation of this chapter and ANSI, you will receive a notice of noncompliance and we may withdraw your certification. (See WAC 296-150R-0710, 296-150R-0920.)

(2) If you disagree with our decision, you can send us a written request for a hearing, stating why you disagree.

(3) After we receive your hearing request, we will:

(a) Schedule a hearing within thirty days after we receive your request.

(b) Notify you of the time, date, and place for the hearing. If you fail to appear, your case will be dismissed.

(c) Hear your case.

(d) Send you written notice of our decision.

If you disagree with our decision, you may appeal it under the Administrative Procedure Act (chapter 34.05 RCW).

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-0100, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0100, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0110 Do you have an advisory board to address recreational vehicle issues? The factory assembled structures (FAS) board advises us on issues relating to plumbing, heating, electrical, installation, alterations, inspections, and rules for recreational vehicles. (See RCW 43.22.420.)

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-0110, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0110, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0120 Where can I obtain technical assistance regarding recreational vehicles? We provide field technical service to recreational vehicle manufacturers for an hourly fee (see WAC 296-150R-3000). Field technical service may include an evaluation, consultation, plan examination, interpretation, and clarification of technical data relating to the application of our rules. It does not include inspections.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-0120, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0120, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0130 Do you allow recreational vehicles to be displayed without an insignia? We allow one recreational vehicle to be displayed without an insignia, if you:

(1) Get written approval from us in advance of displaying the unit; we should receive your written request at least thirty days prior to display of the unit. Your request must include:

- (a) The model and serial number of the unit;
- (b) The location where the unit will be displayed; and
- (c) The date(s) the unit will be displayed.

(2) Are licensed in Washington state through the department of licensing;

- (3) Have your approval letter available at the display;
- (4) Place three visible signs on the display unit:
 - (a) One at the main entry door;
 - (b) One inside the front of the unit; and
 - (c) One inside the back of the unit.

The signs must read: *Not For Sale - Display Only*.

The letters on the sign must be one inch or higher.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-0130, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0130, filed 10/23/96, effective 11/25/96.]

REQUIREMENTS FOR INSIGNIA AND OTHER VEHICLE IDENTIFICATION

WAC 296-150R-0200 Who should obtain recreational vehicle insignia? (1) If you manufacture recreational vehicles to be sold or leased in Washington, you must purchase either a state-plan or self-certified insignia for each vehicle.

(2) Individuals that build recreational vehicles to sell or lease in Washington must purchase an insignia.

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(3) If you have a vehicle with either a state-plan or self-certified insignia and you plan to alter or have another person alter it, you must obtain an alteration insignia from us.

Note: You do not need to purchase our insignia if you manufacture recreational vehicles in Washington for sale outside the state.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-0200, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0200, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0210 How do I obtain insignia information and the forms you require? Upon request, we will provide you with a packet of information that includes required forms and fee schedule for obtaining the state-plan or self-certified insignia. Our address is noted in the definition of department.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0210, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0220 How do I obtain insignia based on state-plan approval? (1) If you are approved to purchase insignia based on state-plan approval, you may purchase the insignia by submitting the insignia application with the required fees. (See WAC 296-150R-3000.)

(2) The application must include:

(a) A signed statement from you certifying that you are manufacturing your units according to your approved design plans and your quality control program; and

(b) A list of the approved design plans against which you will apply the insignia.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0220, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0230 How do I obtain insignia based on self-certification approval? If you are approved to purchase insignia based on self-certification approval, you may purchase the insignia by submitting the insignia application with the required fees. (See WAC 296-150R-3000.) The application must include the design plan with a signed statement from you certifying that you are manufacturing your units according to your comprehensive design plans and your quality control program.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0230, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0250 How do I replace lost or damaged insignia? (1) If an insignia is lost or damaged after it is placed on a recreational vehicle and you are the manufacturer or owner, you must notify us in writing immediately.

(2) Your notification should include the following information:

- (a) Your name, address, and telephone number;
- (b) The vehicle identification number or serial number and model;
- (c) The insignia number and design-plan approval number, if applicable; and
- (d) The required fee. (See WAC 296-150R-3000.)

(3) If we can determine that your unit previously had an insignia, we will attach the insignia to your vehicle once we receive your insignia fee. (See WAC 296-150R-3000.)

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-0250, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0250, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0280 What other vehicle identification is required? Every *new* recreational vehicle manufactured, offered for sale or lease, or sold or leased in Washington must also have a vehicle identification number (VIN) label in compliance with the Federal Department of Transportation (DOT) safety standards.

Note: Truck campers do not require a vehicle identification number (VIN). They have a manufacturer's serial number.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-0280, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0280, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0290 When and where should the insignia and the vehicle identification label be attached to the vehicle? (1) Insignia must be attached to the finished vehicle before it leaves the approved manufacturer's location.

(2) The state-plan or self-certification insignia must be attached adjacent to the main door, on the strike side of the door, at least twelve inches above the floor line. The strike side of the door is opposite the hinge side of the door.

(3) The alteration insignia must be attached next to the certification insignia.

(4) The vehicle identification number (VIN) label must be attached on the vehicle as required by the Federal Department of Transportation. Any other vehicle identification label must be attached next to the certification insignia or on the exterior front half of the left side of the vehicle, at least six inches above the floor line.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0290, filed 10/23/96, effective 11/25/96.]

STATE PLAN

WAC 296-150R-0300 What is required to obtain insignia based on state-plan approval? If you want to obtain insignia based on state-plan approval, you must:

(1) Have your design plan and quality control manual approved by us; and

(2) Pass a quality control program comprehensive audit which includes a random inspection of your vehicles.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0300, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0310 What is required after I am approved as a state-plan manufacturer? Once you have obtained approval as a state-plan manufacturer:

(1) You are required to submit comprehensive design plans to us for approval;

(1999 Ed.)

(2) You can inspect your own vehicles based upon your quality control manual specifications; and

(3) You are subject to an annual comprehensive audit at your manufacturing location(s).

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0310, filed 10/23/96, effective 11/25/96.]

DESIGN PLAN

WAC 296-150R-0320 How do I apply for design-plan approval? Upon request, we will send you a design-plan approval request form.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0320, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0330 What is required for comprehensive design-plan approval? If you are the manufacturer applying for state-plan approval:

(1) You must submit two sets of comprehensive design plans (do not send originals) to us for approval. Design plans must be accompanied by the initial filing fee, if appropriate, and the design plan fee. (See WAC 296-150R-3000.)

(2) Your comprehensive design plan must indicate compliance with the appropriate ANSI standards in the following plans and drawings:

(a) Floor plans relating to fire and life safety, electrical, plumbing, liquefied petroleum (LP) and/or natural gas systems and appliances, and air conditioning systems, if applicable, of each vehicle.

(b) Plumbing line drawings which describe the size, length and location of gas piping lines, liquid and body waste lines, liquid and body waste tanks, and potable water tanks.

(c) Electrical drawings.

Note: We will provide a check list with detailed requirements for each type of plan upon request.

(3) Current comprehensive design plans must be available at each manufacturing location.

(4) You must have an approved quality control manual. (See WAC 296-150R-0400, 296-150R-0410.)

Note: You do not need a quality control manual if you are an individual asking us to inspect a vehicle.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0330, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0340 What happens if you approve my design plan? (1) Your design plan will be approved if it complies with the requirements of this chapter and ANSI.

(2) We will send you an approved copy of the design plan with the approval number.

(3) You must keep copies of the approved design plan for all models produced at the manufacturing location.

(4) If your design plan is not approved, you will be notified in writing of plan deficiencies. You may send a corrected design plan to us.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0340, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0350 If my design plan is not approved, how much time do I have to submit a corrected plan? (1) You have ninety days to correct and resubmit your original design plan and send us the resubmittal fee once we notify you of plan deficiencies. After ninety days, your initial design plan is returned to you.

(2) If you submit your corrected design plan after ninety days, you must send the initial design plan fee instead of the resubmittal fee. (See WAC 296-150R-3000.)

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0350, filed 10/23/96, effective 11/25/96.]

QUALITY CONTROL PROGRAM/MANUAL

WAC 296-150R-0400 What constitutes an acceptable quality control program/manual for state-plan insignia? Your quality control program must implement your approved quality control manual. The quality control manual must provide instructions, procedures, and assign responsibilities to assure quality control requirements are met when vehicles are manufactured. The minimum quality control manual requirements are:

(1) An organization chart which identifies quality assurance positions and describes quality control responsibilities and accountability for the following plant personnel: General manager, plant production manager, plant foreperson, lead persons, production, quality control, sales, engineering, purchasing, and receiving staff;

(2) A method to distribute all comprehensive design plans and installation instructions or other documentation that ensures all products used are installed correctly in all recreational vehicle models produced at each manufacturing location;

(3) Procedures for maintaining the quality assurance of each vehicle model;

(4) Drawings and procedures displaying manufacturing processes including a schematic plant layout;

(5) Descriptions of production stations, including surge-hold stations, on-site or off-site repair-rework locations, and off-line construction sites. Descriptions should identify by station and location the work, tests, or inspections performed and the job title of the person performing the quality control review;

(6) Inspection and equipment maintenance instructions, including jig maintenance, check-off lists, and other documentation verifying quality control performance and accountability;

(7) Coordination of staff duties ensuring smooth transition of manufacturing responsibilities during the shift change;

(8) Instructions regarding the identification, control, and handling of damaged goods or materials that do not comply with existing rules and ANSI;

(9) Information about recreational vehicle material storage and environmental control including protection from the weather and the elimination of scrap and age-dated materials which have exceeded their life;

(10) Verification that testing equipment is properly calibrated and that your gauges are accurate;

(11) Information about production line testing which includes descriptions of procedures, test equipment, and the location of each test. The information should demonstrate accountability for test completion, for rework and repair, and for retesting;

(12) Instructions, procedures, descriptions, and responsibilities for insignia storage, security, application, and inventory;

(13) Procedures for mixed production lines, for variable production rates, for new or substitute personnel, and for new or changed inspections and tests;

(14) Instructions, procedures, and responsibilities for keeping vehicle records which include the unit serial number, model, plan approval number, dealer location or destination, insignia number, inspection, and test results;

(15) Information about your quality control training program; and

(16) Procedures for introducing new designs, models, materials and equipment to staff that ensures products are built according to the standards and the manufacturer's instructions.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-0400, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0400, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0410 How do I apply to have my quality control manual approved? We will provide the form and instructions upon request.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0410, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0420 What happens if my quality control manual is approved? (1) Your quality control manual will be approved if it meets the requirements of this chapter and ANSI.

(2) We will send you an approved copy of your quality control manual.

(3) If your quality control manual is not approved, you will be notified in writing of the deficiencies. You may send us a corrected quality control manual.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0420, filed 10/23/96, effective 11/25/96.]

DESIGN PLAN/QUALITY CONTROL MANUAL— REVIEW, CHANGE/ADDENDUM, EXPIRATION, AND RENEWAL

WAC 296-150R-0440 Do I need approval to change my design plan or quality control manual after I receive state-plan approval? (1) Once you have received state-plan approval and you want to change your design plan or quality control manual, we must approve the changes/addendums.

(2) You should send design plan or quality control manual changes to us thirty days before you want the changes/addendums to take effect.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0440, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0450 When does state-plan insignia approval expire? As a state-plan manufacturer, your approval for insignia is based upon approval of your design plan and quality control manual. Design plans are considered approved until a new ANSI code edition is adopted or unless revisions to ANSI prior to code changes would not support our design plan approval.

Note: ANSI codes are normally adopted for a three-year period.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0450, filed 10/23/96, effective 11/25/96.]

INSPECTION

WAC 296-150R-0600 When does a manufacturer, individual builder, or a dealer need to request a vehicle inspection? If you are a manufacturer, individual builder, or a dealer, you must request a vehicle inspection by us:

- (1) If you have approval of your design plan and quality control manual and need to complete the state-plan process;
- (2) If you are making a vehicle alteration which must be inspected and approved by us; or
- (3) If you are correcting a violation which must be inspected and approved by us.

Note: An individual who is building a vehicle to own, sell, or lease must obtain a vehicle identification number from the state patrol prior to our issuance of certification insignia.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0600, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0610 How do I request a vehicle inspection and what documentation is required? (1) Complete an inspection application which can be obtained from us.

(2) Send the completed application, application fee, and inspection fee to us prior to the date you would like an inspection performed. (See WAC 296-150R-3000.)

(3) During the inspection, have your approved design plans, specifications, and test results available for our inspector.

(4) A vehicle inspection will be completed in two phases. The "cover" inspection during the construction of the unit before the electrical, plumbing, mechanical, heating, and structural systems are covered. The final inspection takes place after the vehicle is complete.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0610, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0620 What happens if my vehicle passes inspection? (1) If your vehicle passes inspection and you have met the other requirements of this chapter and ANSI, you will be approved to purchase state-plan insignia from us.

(2) If you send your insignia application and fee to us prior to the inspection, we will attach your insignia when we approve the vehicle.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0620, filed 10/23/96, effective 11/25/96.]

(1999 Ed.)

WAC 296-150R-0630 What happens if my vehicle does not pass inspection? (1) If your vehicle does not pass inspection, you will receive a notice of noncompliance.

(2) You have ten days after receiving the notice of noncompliance to send us a written response explaining how you will correct the violation(s) and prevent its reoccurrence.

(3) You are not allowed to move, sell or lease a vehicle until:

- (a) You correct the violation(s);
- (b) We inspect and approve the correction(s); and
- (c) You pay the inspection fee and the insignia fee, if required. (See WAC 296-150R-3000.)

(4) If you fail to make the corrections, the sale or lease of your vehicle is prohibited by RCW 43.22.340 until the corrections are made.

Note: You will be allowed to return a vehicle to the manufacturing location or to another location for correction with our approval.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0630, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0640 Am I charged if I request an inspection but I am not prepared? (1) If you ask us to inspect recreational vehicles within Washington state but are not prepared when we arrive, you must pay the minimum inspection fee and travel.

(2) If you ask us to inspect recreational vehicles outside Washington state but are not prepared when we arrive, you must pay the minimum inspection fee, travel, and per diem expenses.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-0640, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0640, filed 10/23/96, effective 11/25/96.]

AUDIT

WAC 296-150R-0700 What does our annual quality control program audit for state-plan insignia include? (1) During your annual comprehensive audit for state-plan insignia, we will review your quality control program and randomly inspect your vehicles.

(2) If our comprehensive audit indicates that you are complying with the requirements of this chapter and ANSI, you may purchase state-plan insignia.

(3) If we discover a quality control program deficiency or a vehicle violation during our comprehensive audit, you will receive a notice of noncompliance and cannot purchase state-plan insignia until the deficiency or violation is corrected.

(a) You can correct the deficiency or violation during the comprehensive audit; or

(b) You have fourteen days after receiving the notice of noncompliance to send us a written response explaining your correction of the deficiency or violation;

(c) You are subject to a follow-up comprehensive audit.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0700, filed 10/23/96, effective 11/25/96.]

LOSS OF STATE-PLAN APPROVAL

WAC 296-150R-0710 Can you withdraw my state-plan insignia approval? Should you fail to meet the requirements of this chapter and ANSI after you have been approved to purchase state-plan insignia, we will withdraw your certification.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0710, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0720 What happens if my state-plan insignia approval is withdrawn? If your state-plan insignia approval is withdrawn because you have failed to comply with this chapter and ANSI:

- (1) You must return any issued but unused insignia to us; and
- (2) You cannot sell or lease vehicles in Washington.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0720, filed 10/23/96, effective 11/25/96.]

SELF-CERTIFICATION**AUDIT TO RECEIVE SELF-CERTIFICATION**

WAC 296-150R-0800 What is required for self-certification? If you want to be self-certified, you must:

- (1) Send us a written request for self-certification;
- (2) Have us approve your self-certification quality control manual;
- (3) Have us approve your comprehensive design plans for the current models you sell in Washington state if you do not already have approved design plans;
- (4) Initially be audited by us, and then be audited at least every six months by an industry association or independent inspection auditor who conducts quality control audits;
- (5)(a) The manufacturer must designate an industry association or other independent auditor to perform audits of the manufacturer at least every six months.

(b) The manufacturer must provide written approval from the auditor designated under (a) of this subsection and provide a copy of such approval to the department. The approval form must allow us to review all documentation and information collected by the auditor during the auditor's periodic audits of the manufacturer. The department shall conduct a performance audit of the industry association or other independent inspection auditor at least once every two years.

(c) If the designated auditor refuses to allow the department to conduct a performance audit, then the department may conduct a performance audit of the manufacturer's quality control program. If both the designated auditor and manufacturer refuse to allow a performance audit, then the department may conduct a comprehensive audit as authorized by RCW 43.22.355(4).

Note: If you do not use an industry association or independent inspection auditor to conduct your quality control audits, you may apply for insignia under the state-plan process for insignia approval.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0800, filed 10/23/96, effective 11/25/96.]

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WAC 296-150R-0810 What does the initial self-certification audit include? During the initial self-certification comprehensive audit, we will:

- (1) Review your quality control program;
- (2) Review your comprehensive design plans; and
- (3) Randomly inspect your vehicles.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0810, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0820 How will I know if I am approved for self-certification? (1) If the initial self-certification comprehensive audit indicates that you are complying with this chapter and ANSI, we will send you a self-certification approval letter. Once you are approved as self-certified you may purchase self-certification insignia.

(2) If we discover a quality control program deficiency or a vehicle violation during our initial audit, you will receive a notice of noncompliance and cannot purchase the self-certification insignia until the deficiency or violation is corrected.

- (a) You can correct the deficiency or violation during the audit; or
- (b) You have fourteen days after receiving the notice of noncompliance to send us a written response explaining your correction of the deficiency or violation;
- (c) You are subject to a follow-up comprehensive audit, to verify correction of the deficiency or violation.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0820, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0830 What are the self-certification fees? (1) If you are a new manufacturer applying for self-certification, you must pay the initial filing fee, the quality control manual fee, the audit fee, travel and per diem expenses.

(2) If you are a current state-plan manufacturer applying for self-certification who has approved design plans with the department, you must pay the self-certification quality control manual fee, the audit fee, travel and per diem expenses.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0830, filed 10/23/96, effective 11/25/96.]

SELF-CERTIFICATION COMPREHENSIVE DESIGN PLAN/QUALITY CONTROL PROGRAM/QUALITY CONTROL MANUAL

WAC 296-150R-0840 What is required for comprehensive design plan approval for self-certification? (1) If you are a *new manufacturer* applying for self-certification:

(a) You must send us two sets of comprehensive design plans (do not send originals) for approval. Design plans must be accompanied by the appropriate fees. (See WAC 296-150R-3000.)

(b) Your comprehensive design plan must indicate compliance with the appropriate ANSI standards in the following plans and drawings:

(i) Floor plans relating to fire and life safety, electrical, plumbing, liquefied petroleum (LP) and/or natural gas systems and appliances, and air conditioning systems, if applicable to the plan of each vehicle.

- (ii) Plumbing line drawings which describe the size, length and location of gas piping lines, liquid and body waste lines, liquid and body waste tanks, and potable water tanks.
- (iii) Electrical drawings.

Note: We will provide you with a check list with detailed requirements for each type of plan upon request.

(c) Current comprehensive design plans must be available at each manufacturing location.

(2) If you are a state-plan approved manufacturer applying for self-certification, you must have approved comprehensive design plans on file with us and at each manufacturing location.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0840, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0850 What constitutes an acceptable quality control program/manual for self-certification? Your quality control program must implement your approved quality control manual. The quality control manual must provide instructions, procedures, and assign responsibilities to assure quality control expectations are met when vehicles are manufactured. The minimum quality control manual requirements are:

(1) An organization chart which identifies quality assurance positions and describes quality control responsibilities and accountability for the following plant personnel: General manager, plant production manager, plant foreperson, lead persons, production, quality control, sales, engineering, purchasing and receiving staff;

(2) A method to distribute all comprehensive design plans and installation instructions or other documentation that ensures all products used are installed correctly in all recreational vehicle models produced at each manufacturing location;

(3) Procedures for maintaining the quality assurance of each vehicle model;

(4) Drawings and procedures displaying manufacturing processes including a schematic plant layout;

(5) Descriptions of production stations, including surge-hold stations, on-site or off-site repair-rework locations, and off-line construction sites. Descriptions should identify by station and location the work, tests, or inspections performed and the job title of the person performing the quality control review;

(6) Inspection and equipment maintenance instructions, including jig maintenance, check-off lists, and other documentation verifying quality control performance and accountability;

(7) Coordination of staff duties ensuring smooth transition of manufacturing responsibilities during the shift change;

(8) Instructions regarding the identification, control, and handling of damaged goods or materials that do not comply with existing rules and ANSI;

(9) Information about recreational vehicle material storage and environmental control including protection from the weather and the elimination of scrap and age-dated materials which have exceeded their life;

(1999 Ed.)

(10) Verification that testing equipment is properly calibrated and that your gauges are accurate;

(11) Information about production line testing which includes descriptions of procedures, test equipment, and the location of each test. The information should demonstrate accountability for test completion, for rework and repair, and for retesting;

(12) Instructions, procedures, descriptions, and responsibilities for insignia storage, security, application, and inventory;

(13) Procedures for mixed production lines, for variable production rates, for new or substitute personnel, and for new or changed inspections and tests;

(14) Instructions, procedures, and responsibilities for keeping vehicle records which include the unit serial number, model, plan approval number (if applicable), dealer location or destination, insignia number, inspection, and test results;

(15) Information about your quality control training program;

(16) Procedures for introducing new designs, models, materials and equipment to staff that ensures products are built according to the standards and the manufacturer's instructions; and

(17) Written authorization as required in WAC 296-150R-0800(5).

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-0850, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0850, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0860 After becoming self-certified, do I need approval to change my comprehensive design plan? (1) Once you are self-certified, you are not required to send us your comprehensive design plans nor are we required to approve your comprehensive design plan changes.

(2) You are required to maintain your comprehensive design plans for each model at each manufacturing location where the models are produced.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0860, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0870 After becoming self-certified, do I need approval to change my quality control manual? Once you are self-certified, you are required to have any changes to your quality control manual approved by us.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0870, filed 10/23/96, effective 11/25/96.]

AUDIT AFTER SELF-CERTIFICATION

WAC 296-150R-0900 When do you audit self-certified manufacturers? (1) We audit self-certified manufacturers, if we have reason to believe, you are not complying with this chapter and ANSI.

(2) Reasons to believe that you may not be complying with this chapter and ANSI may include, but are not limited to:

(a) Consolidation of manufacturing locations or relocation of your manufacturing plant;

(b) Complaints from dealers, consumers, or other interested parties that you are not complying with this chapter and ANSI;

(c) Change of business ownership; or

(d) Noncompliance with the requirements of this chapter.

(3) A comprehensive or performance audit based on WAC 296-150R-0800 (5)(c).

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0900, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0910 After I am self-certified, what does an audit include? A performance audit after you are self-certified includes:

(1) A review of your quality control program;

(2) Verification that you are manufacturing vehicles according to this chapter and ANSI; and

(3) Verification that your comprehensive design plans are available at all locations where the vehicles are manufactured.

Note: Our audit may include a review of the comprehensive design plans at your manufacturing location.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0910, filed 10/23/96, effective 11/25/96.]

LOSS OF SELF-CERTIFICATION

WAC 296-150R-0920 Can you withdraw my self-certification? Should you fail to meet the requirements of this chapter and ANSI after you have been approved for self-certification, your self-certification can be withdrawn.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0920, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-0930 What happens if my self-certification is withdrawn? If your self-certification is withdrawn because you have failed to comply with this chapter and ANSI:

(1) You must return any issued but unused insignia to us; and

(2) You cannot sell or lease vehicles in Washington.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-0930, filed 10/23/96, effective 11/25/96.]

VEHICLE ALTERATIONS

WAC 296-150R-1000 Who needs approval to alter a recreational vehicle? (1) Any alteration by a manufacturer, dealer, or individual to a vehicle with state-certified insignia must be approved by us before the alteration is made. "Alteration" is defined in WAC 296-150R-0020.

(2) Any alteration by a manufacturer, dealer, or individual to a vehicle with self-certified insignia after it leaves the manufacturer's location must be approved by us before the alteration is made.

Note: We may remove your insignia if you alter or have someone alter a vehicle without our approval.

[Title 296 WAC—p. 2066]

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-1000, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-1000, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-1010 Must I purchase a separate insignia for an alteration? You are required to purchase an alteration insignia from us.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-1010, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-1020 How do I apply for alteration approval and obtain the alteration insignia? (1) To apply for alteration approval and the alteration insignia, you must:

(a) Complete an alteration permit form and an application for alteration insignia. We will provide the forms.

(b) Submit the completed forms, with the inspection fee and altered vehicle insignia fee, to us. (See WAC 296-150R-3000.)

(2) Our vehicle inspection of the alteration will be in two phases. The "cover" inspection during the alteration of the unit before the electrical, plumbing, mechanical, heating, or other systems are covered. The final inspection takes place after the vehicle is complete.

(3) Once we approve your alteration, we will attach the alteration insignia.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-1020, filed 10/23/96, effective 11/25/96.]

MANUFACTURER'S NOTICE TO THE DEPARTMENT

WAC 296-150R-2000 Must state-plan and self-certified manufacturers notify you if they manufacture at more than one location? (1) We must approve each recreational vehicle manufacturing location producing units for sale or lease in Washington state.

(2) You must send us the following information for each manufacturing location when you are certified:

(a) Company name;

(b) Mailing and physical address;

(c) Phone and FAX number if available;

(d) Type of recreational vehicle(s) manufactured;

(e) Contact person for plan review; and

(f) Contact person for plant audit.

(3) You must update the information as it changes.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-2000, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-2000, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-2010 Must state-plan and self-certified manufacturers notify you if they change a business name or address? (1) If you are moving your business from an approved manufacturing location, the new location must be approved before shipping units from that location for sale or lease in Washington state.

(2) You must notify us in writing prior to a change of business name or address.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-2010, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-2020 Must state-plan and self-certified manufacturers notify you of a change in business ownership? (1) When a recreational vehicle manufacturing business changes ownership, the new owner must notify us in writing immediately.

(2) A new owner may continue to manufacture vehicles using approved design plans or comprehensive design plans according to this chapter.

(3) The department will perform a comprehensive audit of the manufacturer after the ownership change to ensure you are meeting the requirements of this chapter and ANSI.

[Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-2020, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-2020, filed 10/23/96, effective 11/25/96.]

WAC 296-150R-2030 Must state-plan and self-certified manufacturers notify you of their Washington dealers? (1) You must send us the following information about yourself and each of your Washington dealers when you are certified:

- (a) Dealership name;
- (b) Mailing and physical address;
- (c) Phone and FAX number if available;
- (d) Type of recreational vehicle(s); and
- (e) Contact person.

(2) You must update this information as it changes.

[Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-2030, filed 10/23/96, effective 11/25/96.]

RECREATIONAL VEHICLE AND PARK TRAILER FEES

WAC 296-150R-3000 Recreational vehicle fees.

WAC 296-150R-3000 RECREATIONAL VEHICLE FEES	
STATE PLAN	
INITIAL FILING FEE	\$27.00
DESIGN PLAN FEES:	
NEW PLAN REVIEW FEE	\$75.75
RESUBMIT FEE	\$54.00
ADDENDUM	\$54.00
STATE PLAN/MANUAL FEES:	
INITIAL APPROVAL	\$10.50
RESUBMITTAL	\$54.00
ADDENDUM	\$54.00
DEPARTMENT AUDIT FEES:	
AUDIT (PER HOUR)*	\$54.00
TRAVEL (PER HOUR)*	\$54.00
PER DIEM**	
HOTEL***	
MILEAGE**	
RENTAL CAR***	
PARKING***	
AIRFARE***	
DEPARTMENT INSPECTION FEES:	
INSPECTION (PER HOUR)*	\$54.00
TRAVEL (PER HOUR)*	\$54.00
PER DIEM**	
HOTEL***	
MILEAGE**	
RENTAL CAR***	
PARKING***	
AIRFARE***	
INSIGNIA FEES:	
STATE CERTIFIED	\$10.00
ALTERATION	\$27.00
REISSUED-LOST/DAMAGED	\$10.00
OTHER FEES:	
FIELD TECHNICAL SERVICE (Per hour* plus travel time* and mileage**.)	\$54.00
PUBLICATION PRINTING AND DISTRIBUTION OF RCW'S AND WAC'S (One free copy per year.)	\$10.50
* Minimum charge of 1 hour; time spent greater than 1 hour is charged in 1/2 hour increments	
** Per state guidelines.	
*** Actual charges incurred.	

WAC 296-150R-3000 RECREATIONAL VEHICLE FEES	
SELF CERTIFICATION	
INITIAL FILING FEE	\$27.00
DESIGN PLAN	
NEW PLAN REVIEW FEE (ONE TIME FEE)	\$75.75
RESUBMIT FEE	\$54.00
ADDENDUM	\$54.00
SELF CERTIFICATION/MANUAL FEES	
INITIAL APPROVAL	\$10.50
RESUBMITTAL	\$54.00
ADDENDUM	\$54.00
DEPARTMENT AUDIT FEES	
AUDIT (PER HOUR)*	\$54.00
TRAVEL (PER HOUR)*	\$54.00
PER DIEM**	
HOTEL***	
MILEAGE	
RENTAL CAR***	
PARKING***	
AIRFARE***	
DEPARTMENT INSPECTION FEES	
INSPECTION (PER HOUR)*	\$54.00
TRAVEL (PER HOUR)*	\$54.00
PER DIEM**	
HOTEL***	
MILEAGE**	
RENTAL CAR***	
PARKING***	
AIRFARE***	
INSIGNIA FEES	
SELF CERTIFIED	\$10.00
ALTERATION	\$27.00
REISSUED-LOST/DAMAGED	\$10.00
OTHER FEES:	
FIELD TECHNICAL SERVICE (Per hour* plus travel time* and mileage**.)	\$54.00
PUBLICATION PRINTING AND DISTRIBUTION OF RCW'S AND WAC'S (One free copy per year.)	\$10.50
* Minimum charge of 1 hour; time spent greater than 1 hour is charged in 1/2 hour increments	
** Per state guidelines.	
*** Actual charges incurred.	

[Statutory Authority: Chapters 18.106, 18.27 and 43.22 RCW. 98-12-041, § 296-150R-3000, filed 5/29/98, effective 6/30/98. Statutory Authority: RCW 43.22.340 and 43.22.420. 97-16-043, § 296-150R-3000, filed 7/31/97, effective 12/1/97. Statutory Authority: RCW 43.22.340, [43.22.]355, [43.22.]360, [43.22.]432, [43.22.]440 and [43.22.]480. 96-21-146, § 296-150R-3000, filed 10/23/96, effective 11/25/96.]

Chapter 296-155 WAC

SAFETY STANDARDS FOR CONSTRUCTION WORK

WAC

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(1999 Ed.)

- 296-155-003 Subsections, subdivisions, items, subitems, and segments.
- 296-155-005 Purpose and scope.
- 296-155-006 Equipment approval by nonstate agency or organization.
- 296-155-007 Incorporation of standards of national organization.
- 296-155-008 Incorporation of standards of federal agency.
- 296-155-009 Equipment whether or not owned by, or under control of the employer.
- 296-155-010 Variance and procedure.
- 296-155-012 Definitions applicable to all sections of this chapter.
- 296-155-015 Education and first-aid standards.
- 296-155-020 Housekeeping.
- 296-155-030 Acceptable certifications.
- 296-155-035 General requirements.
- 296-155-040 Safe place standards.

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296-155-675	Scope, application, and definitions applicable to this part.	296-155-175	Scope and application. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-175, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-680	General provisions.	296-155-17505	Definitions. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17505, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-681	Safe walking surfaces on concrete structural members.	296-155-17510	Permissible exposure limits (pel). [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17510, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-682	Requirements for equipment and tools.	296-155-17515	Communication among employers. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17515, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-683	Concrete finishing.	296-155-17520	Identification. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17520, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-684	Requirements for cast in place concrete.	296-155-17525	Regulated areas. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17525, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-685	Tubular welded frame shoring.	296-155-17530	Exposure monitoring. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17530, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-686	Tube and coupler shoring.	296-155-17532	Methods of compliance. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17532, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-687	Single post shores.	296-155-17535	Respiratory protection. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17535, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-688	Vertical slip forms.	296-155-17540	Protective clothing. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17540, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-689	Placing and removal of forms.	296-155-17545	Hygiene facilities and practices. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17545, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-690	Appendix to WAC 296-155-684 cast in place concrete.	296-155-17550	Communication of hazards to employees. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17550, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-691	Precast concrete and tilt-up operations.	296-155-17555	Housekeeping. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17555, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-694	Requirements for lift-slab construction operations.	296-155-17560	Medical surveillance. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17560, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-695	Miscellaneous concrete construction.	296-155-17565	Recordkeeping. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17565, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-697	Requirements for masonry construction.		
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296-155-710	Structural steel assembly.		
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296-155-725	Definitions applicable to this part.	296-155-17532	Methods of compliance. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17532, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-730	Tunnels and shafts.	296-155-17535	Respiratory protection. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17535, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-735	Caissons.	296-155-17540	Protective clothing. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17540, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-740	Cofferdams.	296-155-17545	Hygiene facilities and practices. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17545, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-745	Compressed air.	296-155-17550	Communication of hazards to employees. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17550, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-74501	Appendix A—Decompression tables.	296-155-17555	Housekeeping. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17555, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
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296-155-755	Roofing, insulating and waterproofing.	296-155-17560	Medical surveillance. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17560, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-765	Rock crushing, gravel washing, and hot mix plants.	296-155-17565	Recordkeeping. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17565, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-770	Moving of structures.		
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296-155-775	Preparatory operations.		
296-155-780	Stairs, passageways, and ladders.		
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296-155-810	Catch platforms.		
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296-155-825	Mechanical demolition.		
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296-155-950	Rollover protective structures (ROPS) for material handling equipment.	296-155-17565	Recordkeeping. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17565, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
296-155-955	Minimum performance criteria for rollover protective structures for designated scrapers, loaders, dozers, graders, and crawler tractors.		

- 296-155-17570 Dates. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17570, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17575 Appendices. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17575, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-177 Appendix A—WISHA reference method—Mandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-177, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-179 Appendix B—Detailed procedure for asbestos, tremolite, anthophyllite, and actinolite sampling and analysis—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-179, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-181 Appendix C—Qualitative and quantitative fit testing procedures—Mandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-181, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-183 Appendix D—Medical questionnaires—Mandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-183, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-185 Appendix E—Interpretation and classification of chest roentgenograms—Mandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-185, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-187 Appendix F—Work practices and engineering controls for major asbestos removal, renovation, and demolition operations—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-187, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-189 Appendix G—Work practices and engineering controls for small-scale, short-duration asbestos renovation and maintenance operations—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-189, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-191 Appendix H—Substance technical information for asbestos—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-191, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-193 Appendix I—Medical surveillance guidelines for asbestos, tremolite, anthophyllite, and actinolite—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-193, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-225 Safety belts, droplines, lifelines, and lanyards. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-225, filed 1/21/86; Order 76-29, § 296-155-225, filed 9/30/76; Order 74-26, § 296-155-225, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
- 296-155-229 Qualified person—Rigging. [Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-13-069, § 296-155-229, filed 6/15/98, effective 8/15/98.] Decodified by 98-16-067, filed 8/4/98, effective 8/4/98. Later promulgation, see WAC 296-155-329.
- 296-155-230 Safety nets. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-230, filed 1/21/86; Order 74-26, § 296-155-230, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
- 296-155-425 Definitions applicable to this part. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-425, filed 1/21/86; Order 74-26, § 296-155-425, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-155-430 General requirements. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-430, filed 1/21/86; Order 77-20, § 296-155-430, filed 10/18/77; Order 77-12, § 296-155-430, filed 7/11/77; Order 74-26, § 296-155-430, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-155-435 Grounding and bonding. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-435, filed 1/21/86; Order 74-26, § 296-155-435, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-155-440 Equipment installation and maintenance. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-440, filed 1/21/86; Order 74-26, § 296-155-440, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-155-450 Battery rooms and battery charging. [Order 74-26, § 296-155-450, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-155-455 Hazardous locations. [Order 74-26, § 296-155-455, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-155-48501 Figure J-1. [Order 76-29, Figure J-1 (codified as WAC 296-155-48501), filed 9/30/76; Order 74-26, § 296-155-485 (part), Figure J-1, filed 5/7/74, effective 6/6/74.] Repealed by 82-08-026 (Order 82-10), filed 3/30/82. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-48502 Figure J-2. [Order 76-29, Figure J-2 (codified as WAC 296-155-48502), filed 9/30/76; Order 74-26, § 296-155-485 (part), Figure J-2, filed 5/7/74, effective 6/6/74.] Repealed by 82-08-026 (Order 82-10), filed 3/30/82. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-48503 Table J-1. [Order 76-29, Table J-1 (codified as WAC 296-155-48503), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-1, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48504 Table J-2. [Order 76-29, Table J-2 (codified as WAC 296-155-48504), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-2, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48505 Table J-3. [Order 76-29, Table J-3 (codified as WAC 296-155-48505), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-3, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48506 Table J-4. [Order 76-29, Table J-4 (codified as WAC 296-155-48506), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-4, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48507 Table J-5. [Order 76-29, Table J-5 (codified as WAC 296-155-48507), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-5, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48508 Table J-6. [Order 76-29, Table J-6 (codified as WAC 296-155-48508), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-6, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48509 Table J-7. [Order 76-29, Table J-7 (codified as WAC 296-155-48509), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-7, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98.

- 296-155-48510 Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. Table J-8. [Order 76-29, Table J-8 (codified as WAC 296-155-48510), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-8, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48511 Table J-9. [Order 76-29, Table J-9 (codified as WAC 296-155-48511), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-9, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48512 Table J-10. [Order 76-29, Table J-10 (codified as WAC 296-155-48512), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-10, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48513 Table J-11. [Order 76-29, Table J-11 (codified as WAC 296-155-48513), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-11, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48514 Table J-12. [Order 76-29, Table J-12 (codified as WAC 296-155-48514), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-12, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48515 Table J-13. [Order 76-29, Table J-13 (codified as WAC 296-155-48515), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-13, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48516 Table J-14. [Order 76-29, Table J-14 (codified as WAC 296-155-48516), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-14, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48517 Table J-15. [Order 76-29, Table J-15 (codified as WAC 296-155-48517), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-15, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48518 Table J-16. [Order 76-29, Table J-16 (codified as WAC 296-155-48518), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-16, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48519 Table J-17. [Order 76-29, Table J-17 (codified as WAC 296-155-48519), filed 9/30/76; Order 74-26, § 296-155-485 (part), Table J-17, filed 5/7/74, effective 6/6/74.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48523 Manually propelled mobile ladder stands and scaffolds (towers). [Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-48523, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48523, filed 1/21/86.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48525 Manually propelled elevating work platforms. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48525, filed 1/21/86.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48527 Self propelled elevating work platforms. [Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-155-48527, filed 8/10/92, effective 9/10/92. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48527, filed 1/21/86.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48529 Boom supported elevating work platforms. [Statutory Authority: Chapter 49.17 RCW. 92-17-022 (Order 92-06), § 296-155-48529, filed 8/10/92, effective 9/10/92; 91-03-044 (Order 90-18), § 296-155-48529, filed 1/10/91, effective 2/12/91; 89-11-035 (Order 89-03), § 296-155-48529, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48529, filed 1/21/86.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48531 Vehicle mounted elevating and rotating aerial devices. [Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-48531, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-48531, filed 7/20/94, effective 9/20/94; 92-17-022 (Order 92-06), § 296-155-48531, filed 8/10/92, effective 9/10/92; 91-03-044 (Order 90-18), § 296-155-48531, filed 1/10/91, effective 2/12/91; 90-17-051 (Order 90-10), § 296-155-48531, filed 8/13/90, effective 9/24/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48531, filed 1/21/86.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48533 Crane or derrick suspended personnel platforms. [Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-24-051, § 296-155-48533, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-48533, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-48533, filed 7/20/94, effective 9/20/94; 91-03-044 (Order 90-18), § 296-155-48533, filed 1/10/91, effective 2/12/91; 90-03-029 (Order 89-20), § 296-155-48533, filed 1/11/90, effective 2/26/90; 89-11-035 (Order 89-03), § 296-155-48533, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-48533, filed 1/21/86.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-48536 Forklift elevated work platforms. [Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-48536, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-48536, filed 5/15/89, effective 6/30/89.] Repealed by 98-05-046, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060.
- 296-155-50501 Appendix—Roofs. [Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-50501, filed 6/17/81.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
- 296-155-580 Aerial lifts. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-580, filed 1/21/86; Order 74-26, § 296-155-580, filed 5/7/74, effective 6/6/74.] Repealed by 90-17-051 (Order 90-10), filed 8/13/90, effective 9/24/90. Statutory Authority: Chapter 49.17 RCW.
- 296-155-65505 Sewage piping system. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-65505, filed 1/21/86.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
- 296-155-660 Specific excavation requirements. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-660, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-660, filed 6/17/81; Order 76-29, § 296-155-660, filed 9/30/76; Order 74-26, § 296-155-660, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
- 296-155-66005 Borrow pits. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-66005, filed 1/21/86.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
- 296-155-665 Specific trenching requirements. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-665, filed 1/21/86; 85-10-004 (Order 85-09), § 296-155-665, filed 4/19/85. Statutory Authority:

- RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-665, filed 6/17/81; Order 77-12, § 296-155-665, filed 7/11/77; Order 76-29, § 296-155-665, filed 9/30/76; Order 74-26, § 296-155-665, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
- 296-155-66501 Table N-1. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-66501, filed 1/21/86; 82-13-045 (Order 82-22), § 296-155-66501, filed 6/11/82; Order 76-29, Table N-1 (codified as WAC 296-155-66501), filed 9/30/76; Order 74-26, § 296-155-665 (part), Table N-1, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
- 296-155-66502 Table N-2. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-66502, filed 1/21/86; Order 76-29, Table N-2 (codified as WAC 296-155-66502), filed 9/30/76; Order 74-26, § 296-155-665 (part), Table N-2, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
- 296-155-66503 Table N-3. [Order 76-29, Table N-3 (codified as WAC 296-155-66503), filed 9/30/76; Order 74-26, § 296-155-665 (part), Table N-3, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
- 296-155-66504 Table N-4. [Order 76-29, Table N-4 (codified as WAC 296-155-66504), filed 9/30/76; Order 74-26, § 296-155-665 (part), Table N-4, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
- 296-155-66505 Table N-5. [Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-66505, filed 6/17/81; Order 76-29, Table N-5 (codified as WAC 296-155-66505), filed 9/30/76; Order 74-26, § 296-155-665 (part), Table N-5, filed 5/7/74, effective 6/6/74.] Repealed by 91-03-044 (Order 90-18), filed 1/10/91, effective 2/12/91. Statutory Authority: Chapter 49.17 RCW.
- 296-155-692 Requirements for lift -slab operations. [Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-692, filed 5/15/89, effective 6/30/89.] Repealed by 90-03-029 (Order 89-20), filed 1/11/90, effective 2/26/90. Statutory Authority: Chapter 49.17 RCW.
- 296-155-750 Masonry construction. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-750, filed 1/21/86; Order 74-26, § 296-155-750, filed 5/7/74, effective 6/6/74.] Repealed by 89-11-035 (Order 89-03), filed 5/15/89, effective 6/30/89. Statutory Authority: Chapter 49.17 RCW.
- 296-155-760 Concrete finishing. [Order 74-26, § 296-155-760, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-850 Definitions applicable to this part. [Order 74-26, § 296-155-850, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-855 General provisions. [Order 74-26, § 296-155-855, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-860 Blaster qualifications. [Order 74-26, § 296-155-860, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-865 Surface transportation of explosives. [Order 74-26, § 296-155-865, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-870 Underground transportation of explosives. [Order 74-26, § 296-155-870, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-875 Storage of explosives and blasting agents. [Order 74-26, § 296-155-875, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-880 Loading of explosives or blasting agents. [Order 74-26, § 296-155-880, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-885 Initiation of explosive charges—Electric blasting. [Order 74-26, § 296-155-885, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-890 Use of safety fuse. [Order 76-29, § 296-155-890, filed 9/30/76; Order 74-26, § 296-155-890, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-895 Use of detonating cord. [Order 74-26, § 296-155-895, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-900 Firing the blast. [Order 74-26, § 296-155-900, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-905 Inspection after blasting. [Order 74-26, § 296-155-905, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-910 Misfires. [Order 74-26, § 296-155-910, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-915 Underwater blasting. [Order 74-26, § 296-155-915, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-155-920 Blasting in excavation work under compressed air. [Order 74-26, § 296-155-920, filed 5/7/74, effective 6/6/74.] Repealed by 86-03-074 (Order 86-14), filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050.

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

PART A

GENERAL SAFETY AND HEALTH PROVISIONS

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

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

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

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

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

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

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

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

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

(2) If a provision of this chapter conflicts with a provision of the general safety and health standard (chapter 296-24 WAC) or the general occupational health standard (chapter 296-62 WAC), the provision of this chapter shall prevail. When a provision of this chapter conflicts with a provision of another vertical safety standard applying to the place of work, the provisions of the vertical standard of specific application shall prevail.

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

WAC 296-155-006 Equipment approval by nonstate agency or organization. Whenever a provision of this chapter states that only that equipment or those processes approved by an agency or organization other than the department of labor and industries, such as the Underwriters Labo-

ratories or the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH), shall be utilized, that provision shall be construed to mean that approval of such equipment or process by the designated agency or group shall be prima facie evidence of compliance with the provisions of this chapter.

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

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

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

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

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

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

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

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

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

WAC 296-155-010 Variance and procedure. Realizing that conditions may exist in operations under which certain state standards will not have practical application, the director of the department of labor and industries or his/her authorized representative may, pursuant to this section, sections eight or nine of the Washington Industrial Safety and Health Act (chapter 80, Laws of 1973, RCW 49.17.080 and 49.17.090) and appropriate administrative rules of this state and the department of labor and industries and upon receipt of application and after adequate investigation by the department, permit a variation from these requirements when other means of providing an equivalent measure of protection are afforded. Such variation granted shall be limited to the particular case or cases covered in the application for variance and

may be revoked for cause. The order granting a variance shall be conspicuously posted on the premises and shall remain posted during the time it is in effect. A copy of the variance shall be available at the work site. All requests for variances from safety and health standards included in this chapter, shall be made in writing to the director of the department of labor and industries at Olympia, Washington, or his/her duly authorized representative, Department of Labor and Industries, P.O. Box 44600, Olympia, Washington 98504-4600.

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

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

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

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

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

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

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

"Confined space" means a space that:

- (1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- (2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and
- (3) Is not designed for continuous employee occupancy.

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

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

"Department" means the department of labor and industries.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Abbreviations used in this chapter:

"ANSI" means American National Standards Institute.

"API" means American Petroleum Institute.

"ASA" means American Standards Association.

"ASAE" means American Society of Agricultural Engineers.

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

"ASME" means American Society of Mechanical Engineers.

"ASTM" means American Society of Testing and Materials.

"AWS" means American Welding Society.

"BTU" means British thermal unit.

"BTUH" means British thermal unit per hour.

"CFM" means cubic feet per minute.

"CFR" means Code of Federal Register.

"CGA" means Compressed Gas Association.

"CIE" means Commission Internationale de l' Eclairage.

"DOT" means department of transportation.

"FRP" means fiberglass reinforced plastic.

"GPM" means gallons per minute.

"ICC" means Interstate Commerce Commission.

"ID" means inside diameter.

"LPG" means liquefied petroleum gas.

"MCA" means Manufacturing Chemist Association.

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

"NBFU" means National Board of Fire Underwriters.

"NEMA" means National Electrical Manufacturing Association.

"NFPA" means National Fire Protection Association.

"NTP" means normal temperature and pressure.

"OD" means outside diameter.

"PSI" means pounds per square inch.

"PSIA" means pounds per square inch absolute.

"PSIG" means pounds per square inch gauge.

"RMA" means Rubber Manufacturers Association.

"SAE" means Society of Automotive Engineers.

"TFI" means The Fertilizer Institute.

"TSC" means Trailer Standard Code.

"UL" means Underwriters' Laboratories, Inc.

"USASI" means United States of America Standards Institute.

"USC" means United States Code.

"USCG" means United States Coast Guard.

"WAC" means Washington Administrative Code.

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

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

WAC 296-155-015 Education and first-aid standards.

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

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

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

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

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

(4) In areas where workers may pass or perform duties, all debris and accumulations of material shall be removed. Hoses and electrical conductors across aisles or passageways

shall be covered or suspended overhead so that there is no tripping hazard.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(4) No employer shall fail or neglect:

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

[Title 296 WAC—p. 2079]

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

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

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

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

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

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

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

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

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

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

PART B-1 OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROL

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

(a) A safe and healthful working environment.

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

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

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

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

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

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

[Title 296 WAC—p. 2080]

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

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

(7) Each employer shall post and keep posted a notice or notices (Job Safety and Health Protection - Form F416-081-000) to be furnished by the department of labor and industries, informing employees of the protections and obligations provided for in the act and that for assistance and information, including copies of the act, and of specific safety and health standards employees should contact the employer or the nearest office of the department of labor and industries. Such notice or notices shall be posted by the employer at each establishment in a conspicuous place or places where notices to employees are customarily posted. Each employer shall take steps to assure that such notices are not altered, defaced, or covered by other material.

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

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

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

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

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

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

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

WAC 296-155-110 Accident prevention program. (1) Exemptions. Workers of employers whose primary business is other than construction, who are engaged solely in maintenance and repair work, including painting and decorating, are exempt from the requirement of this section provided:

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

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

(c) The employer is in compliance with the requirements of WAC 296-24-040 Accident prevention programs, and WAC 296-24-045, Safety and health committee plan.

(2) Each employer shall develop a formal accident-prevention program, tailored to the needs of the particular plant or operation and to the type of hazard involved. The depart-

ment may be contacted for assistance in developing appropriate programs.

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

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

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

(b) How to report unsafe conditions and practices.

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

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

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

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

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

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

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

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

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

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

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

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

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

(d) Attendance shall be documented.

(e) Subjects discussed shall be documented.

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

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

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

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

(a) At the beginning of each job, and at least weekly thereafter, a walk-around safety inspection shall be conducted jointly by one member of management and one

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employee, elected by the employees, as their authorized representative.

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

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

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

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

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

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

(1) Each employer shall have available at all worksites, at all times, a person or persons holding a valid certificate of first-aid training from the department of labor and industries or other organization, association or agency that has been approved by the department.

(a) A valid first-aid certificate is one which is less than three years old.

(b) All crew leaders, supervisors or persons in direct charge of crews shall have a valid first-aid certificate.

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

Note: In emergencies, crew leaders will be permitted to work up to thirty days without having the required certificate, providing an employee in the crew or another crew leaders in the immediate work area has the necessary certificate.

(2) Valid certification shall be achieved by passing a course of first-aid instruction and participation in practical application of the following subject matter:

Bleeding control and bandaging.

Cardio-pulmonary resuscitation "C.P.R."

Poisons.

Shock, unconsciousness, stroke.

Burns, scalds.

Sunstroke, heat exhaustion.

Frostbite, freezing, hypothermia.

Strains, sprains, hernias.

Fractures, dislocation.

Proper transportation of the injured.

Bites, stings.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-120, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW

49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-120, filed 1/21/86; Order 74-26, § 296-155-120, filed 5/7/74, effective 6/6/74.]

WAC 296-155-125 First-aid kit. (1) All employers who employ men and women covered by the act shall furnish first-aid kits as required by the department of labor and industries, (RCW 51.36.030).

(2) First-aid supplies shall be readily accessible when required by this section.

(3) In the absence of readily accessible first-aid supplies such as first-aid kits, first-aid stations, first-aid rooms or their equivalent, all crew trucks, power shovels, cranes, locomotives, loaders, dozers, logging trucks, speeders, freight trucks and similar equipment shall be equipped with not less than a ten package weather-proof first-aid kit.

(4) All crew vehicles used for transporting workers shall be equipped with not less than a ten package weather-proof first-aid kit. When more than five employees are being transported on any one trip, the kit shall be increased in size to comply with a

16-, 24-, or 36-package kit depending upon the number of personnel normally being transported.

(5) At least one weather-proof first-aid kit shall be available on construction jobs, line crews, and other transient or short duration jobs.

(6) The size and quantity of first-aid kits, required to be located at any site, shall be determined by the number of personnel normally dependent upon each kit as outlined in the following table:

Number of Personnel Normally Assigned To Worksite	Minimum First Aid Supplies Required At Worksite
1 - 50 persons	First-aid kit
1 - 5	10 package kit
6 - 15	16 package kit
16 - 30	24 package kit
31 - 50	36 package kit
51 - 200	First-aid station
51 - 75	One 36 and one 10 package kit
76 - 100	One 36 and one 16 package kit
101 - 150	One 36 and one 24 package kit
151 - 200	Two 36 package kits
Over 200 persons	First-aid room

Refer to
WAC 296-24-070

(7) Employers shall establish a procedure to ensure that first-aid kits and required contents are maintained in a serviceable condition.

(8) First-aid kits shall contain at least the following items, in a weatherproof container with individual sealed packages for each type of item:

10 package kit

- 1 Pkg. adhesive bandages, 1" (16 per pkg.)
- 1 Pkg. bandage compress, 4" (1 per pkg.)
- 1 Pkg. scissors* and tweezers (1 each per pkg.)
- 1 Pkg. triangular bandage, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 5 Pkgs. of consulting physician's choice**

16 package kit

- 1 Pkg. absorbent gauze, 24" x 72" (1 per pkg.)
- 1 Pkg. adhesive bandages, 1" (16 per pkg.)
- 2 Pkgs. bandage compresses, 4" (1 per pkg.)
- 1 Pkg. eye dressing (1 per pkg.)
- 1 Pkg. scissors* and tweezers (1 each per pkg.)
- 2 Pkgs. triangular bandages, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 7 Pkgs. of consulting physician's choice**

24 package kit

- 2 Pkgs. absorbent gauze, 24" x 72" (1 per pkg.)
- 2 Pkgs. adhesive bandages, 1" (16 per pkg.)
- 2 Pkgs. bandage compresses, 4" (1 per pkg.)
- 1 Pkg. eye dressing (1 per pkg.)
- 1 Pkg. scissors* and tweezers (1 each per pkg.)
- 6 Pkgs. triangular bandages, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 9 Pkgs. of consulting physician's choice**

36 package kit

- 4 Pkgs. absorbent gauze, 24" x 72" (1 per pkg.)
- 2 Pkgs. adhesive bandages, 1" (16 per pkg.)
- 5 Pkgs. bandage compresses, 4" (1 per pkg.)
- 2 Pkgs. eye dressing (1 per pkg.)
- 1 Pkg. scissors* and tweezers (1 each per pkg.)
- 8 Pkgs. triangular bandages, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 13 Pkgs. of consulting physicians choice**

* Scissors shall be capable of cutting 2 layers of 15 oz. cotton cloth or its equivalent.

** First-aid kits shall be maintained at the ten, sixteen, twenty-four or thirty-six package level. In the event the consulting physician chooses not to recommend items, the department shall be contacted for recommended items to complete the kit.

(9) When practical, a poster shall be fastened and maintained either on or in the cover of each first-aid kit and at or near all phones plainly stating worksite address or location, the phone numbers of available doctors, hospitals, and ambulance services within the district of the worksite.

Note: Preprinted Form No. FSPO 900-001-1 is available from all department offices. First-aid kit Form No. FSPI -005-000 is also available.

(10) Where the eyes or body of any person may be exposed to injurious chemicals and/or materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided, within the work area, for immediate emergency use.

(11) When required by the department, two wool blankets or two fire retardant blankets, capable of supporting 250

pounds each, and a stretcher shall be available in addition to first-aid kits.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-125, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-125, filed 1/21/86; Order 74-26, § 296-155-125, filed 5/7/74, effective 6/6/74.]

WAC 296-155-130 First-aid station. (1) First-aid stations shall be well marked and located as close as practical to the highest concentration of employees.

(2) One person holding a valid first-aid certificate shall be responsible for the proper use and maintenance of the first-aid station.

(3) First-aid stations shall be equipped with a minimum of two first-aid kits, the size of which shall be dependent upon the number of personnel normally employed at the worksite. One first-aid kit may be a permanent wall-mounted kit, but in all cases the station shall be equipped with at least one portable first-aid kit.

(4) The first-aid station shall be equipped with two wool blankets, or two fire retardant blankets capable of supporting 250 pounds each, and a stretcher in addition to first-aid kits.

(5) A roster, denoting the telephone numbers and addresses of doctors, hospitals and ambulance services available to the worksite, shall be posted at each first-aid station.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-130, filed 1/21/86; Order 74-26, § 296-155-130, filed 5/7/74, effective 6/6/74.]

WAC 296-155-135 First-aid room. Refer to the general safety and health standards, WAC 296-24-070.

[Order 74-26, § 296-155-135, filed 5/7/74, effective 6/6/74.]

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

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

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

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

(d) The common drinking cup is prohibited.

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

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

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

(h) The following definitions apply:

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

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

(1999 Ed.)

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

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

(2) Wash water.

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

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

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

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

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

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

(3) Nonpotable water.

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

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

(4) Toilets.

(a) The provisions of this section apply to both portable chemical toilets and to flush toilets, except where flush toilets are used the requirements of WAC 296-24-12007 (1)(a) shall apply instead of (b) of this subsection.

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

TABLE B-1

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

(c) When the employer provides both flush and portable chemical toilets, the number of employees allowed to be

served by the flush toilets, per WAC 296-24-12007 (1)(a) will be calculated. That number will be subtracted from the total number of employees and the employer will be required to provide an adequate number of portable chemical toilets for the number of remaining employees, as required by (b) of this subsection.

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

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

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

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

(e) Specifications. The following specifications apply:

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

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

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

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

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

(vi) Waste containers shall be fabricated from impervious materials, e.g. plastic, steel, fiberglass or their equivalent. Containers shall be water tight and capable of containing the chemical waste in a sanitary manner. The container shall be fitted to the building in a manner so as to prevent insects from entering from the exterior of the building. Containers shall be adequate in size to be used by the number of persons, according to the schedule for minimum requirements, without filling the container to more than half of its volume before regularly scheduled servicing.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

WAC 296-155-145 Occupational noise exposure. The occupational noise exposure requirements of the general occupational health standards, chapter 296-62 WAC, shall apply.

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

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

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

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

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

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

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

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

(5) Beam shutters or caps shall be utilized, or the laser turned off, when laser transmission is not actually required. When the laser is left unattended for a substantial period of time, such as during lunch hour, overnight, or at change of shifts, the laser shall be turned off.

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

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

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

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

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

(1999 Ed.)

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

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

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

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

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

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

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

(5) Subsections (1) and (2) of this section do not apply to the exposure of employees to formaldehyde. Whenever any employee is exposed to formaldehyde, the requirements of WAC 296-62-07540 shall apply.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-160, filed 7/20/94, effective 9/20/94; 88-14-108 (Order 88-11), § 296-155-160, filed 7/6/88; 87-24-051 (Order 87-24), § 296-155-160, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-160, filed 4/27/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-160, filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-155-160, filed 11/30/83; Order 74-26, § 296-155-160, filed 5/7/74, effective 6/6/74.]

WAC 296-155-165 Lighting and illumination. (1) Lighting which is adjusted to provide a margin of safety in production and inspection tasks shall be provided and maintained. The minimum level of task lighting in all indoor work places shall be an average of ten foot-candles measured thirty inches above the floor. MSHA approved cap lights are acceptable for use in tunnel headings.

(2) Whenever general lighting of an entire area is not provided, illumination sufficient to provide visibility of potentially hazardous objects and emergency control equipment shall be supplied. The minimum level of nontask lighting in all indoor work places shall be an average of three foot-candles measured thirty inches above the floor.

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(3) Diffusion and distribution of artificial and natural light. Artificial light sources shall be installed with regard to mounting height, spacing and reflectors or other suitable accessories so as to secure a reasonably uniform distribution of illumination and to avoid glare and sharply defined shadows which could temporarily reduce a person's ability to see clearly.

Note: This section establishes minimal levels of illumination for safety purposes only. Guidelines pertaining to optimal levels of lighting and illumination may be found in Practice for Industrial Lighting ANSI/IES RP7-1979.

(4) The minimum levels specified in subsections (1) and (2) of this section represent averages with the lowest level in an area to be no less than fifty percent of the indicated value.

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

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

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

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

(4) Duration of operations.

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

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

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

(5) Disposal of exhaust materials. The air outlet from every dust separator, and the dusts, fumes, mists, vapors, or

gases collected by an exhaust or ventilating system shall discharge to the outside atmosphere. Collecting systems which return air to work area may be used if concentrations which accumulate in the work area air do not result in harmful exposure to employees. Dust and refuse discharged from an exhaust system shall be disposed of in such a manner that it will not result in harmful exposure to employees.

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

WAC 296-155-173 Methylenedianiline.

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

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

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

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

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

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

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

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

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

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

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

(7) Where products containing MDA are exempted under subsections (2) and (6) of this section, the employer shall maintain records of the initial monitoring results or objective data supporting that exemption and the basis for the

employer's reliance on the data, as provided in the record-keeping provision of WAC 296-155-17331.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(b) The processes and work practices that were in use when the historical monitoring data were obtained are essen-

tially the same as those to be used during the job for which initial monitoring will not be performed;

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

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

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

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

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

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

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

WAC 296-155-17305 Permissible exposure limits.

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

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

WAC 296-155-17307 Communication among employers.

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

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

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

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

(b) The plan shall specifically provide that employees engaged in correcting emergency conditions shall be equipped with the appropriate personal protective equipment and

clothing as required in WAC 296-155-17317 and 296-155-17319 until the emergency is abated.

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

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

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

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

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

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

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

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

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

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

(3) Periodic monitoring and monitoring frequency.

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

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

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

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

(4) Termination of monitoring.

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

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

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

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

(7) Employee notification of monitoring results.

(a) The employer shall, within 15 working days after the receipt of the results of any monitoring performed under this standard, notify each employee of these results, in writing, either individually or by posting of results in an appropriate location that is accessible to affected employees.

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

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

(a) Determine the source of exposure;

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

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

[Statutory Authority: Chapter 49.17 RCW, 93-04-111 (Order 92-15), § 296-155-17311, filed 2/3/93, effective 3/15/93.]

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

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

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

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

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

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

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

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

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

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

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

(ii) General ventilation systems;

(iii) Use of work practices; or

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

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

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

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

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

(5) Compliance program.

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

(b) Upon request this written program shall be furnished for examination and copying to the director, affected employees, and designated employee representatives. The employer shall review and, as necessary, update such plans at least once

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every 12 months to make certain they reflect the current status of the program.

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

WAC 296-155-17317 Respiratory protection. (1) General. The employer shall provide respirators, and ensure that they are used, where required by this section. Respirators shall be used in the following circumstances:

(a) During the time period necessary to install or implement feasible engineering and work practice controls;

(b) In work operations such as maintenance and repair activities and spray application processes for which engineering and work practice controls are not feasible;

(c) In work situations where feasible engineering and work practice controls are not yet sufficient to reduce exposure to or below the PELs; and

(d) In emergencies.

(2) Respirator selection.

(a) Where respirators are required or allowed under this section, the employer shall select and provide, at no cost to the employee, the appropriate respirator as specified in Table 1, and shall assure that the employee uses the respirator provided.

(b) The employer shall select respirators from among those jointly approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health under the provisions of 30 CFR part 11 and chapter 296-62 WAC, Part E.

(c) Any employee who cannot wear a negative-pressure respirator shall be given the option of wearing a positive-pressure respirator or any supplied-air respirator operated in the continuous flow or pressure demand mode.

(3) Respirator program. The employer shall institute a respiratory protection program in accordance with chapter 296-62 WAC, Part E.

(4) Respirator use.

(a) Where air-purifying respirators (cartridge or canister) are used, the employer shall replace the air-purifying element as needed to maintain the effectiveness of the respirator. The employer shall ensure that each cartridge is dated at the beginning of use.

(b) Employees who wear respirators shall be allowed to leave the regulated area to readjust the face piece or to wash their faces and to wipe clean the face pieces on their respirators in order to minimize potential skin irritation associated with respirator use.

(c) Table 1.—Respiratory Protection for MDA

Airborne concentration of MDA or condition of use	Respirator type
a. Less than or equal to 10xPEL	(1) Half-mask respirator with HEPA ¹ cartridge. ²
b. Less than or equal to 50xPEL	(1) Full facepiece respirator with HEPA ¹ cartridge or canister. ²
c. Less than or equal to 1000xPEL	(1) Full facepiece powered air-purifying respirator with HEPA ¹ cartridges. ²
d. Greater than 1000xPEL or unknown	(1) Self-contained breathing concentration apparatus with full facepiece in positive pressure mode;

Airborne concentration of
MDA or condition of use

Respirator type

e. Escape

- (2) Full facepiece positive-pressure demand supplied-air respirator with auxiliary self-contained air supply.
- (1) Any full facepiece air-purifying respirator with HEPA¹ cartridges;²
- (2) Any positive pressure or continuous flow self-contained breathing apparatus with full facepiece or hood.

f. Fire fighting

- (1) Full facepiece self-contained breathing apparatus in positive pressure mode.

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

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

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

(5) Respirator fit testing.

(a) The employer shall perform and record the results of either quantitative or qualitative fit tests at the time of initial fitting and at least annually thereafter for each employee wearing a negative-pressure respirator. The test shall be used to select a respirator facepiece which provides the required protection as prescribed in subsection (4)(c) of this section, Table 1.

(b) The employer shall follow the test protocols outlined in Appendix E of this standard for whichever type of fit testing the employer chooses.

[Statutory Authority: Chapter 49.17 RCW, 93-04-111 (Order 92-15), § 296-155-17317, filed 2/3/93, effective 3/15/93.]

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

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

(2) Removal and storage.

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

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

(c) The employer shall ensure that no employee takes MDA-contaminated work clothing or equipment out of the

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decontamination areas, except those employees authorized to do so for the purpose of laundering, maintenance, or disposal.

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

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

(3) Cleaning and replacement.

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

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

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

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

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

(4) Visual examination.

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

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

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

WAC 296-155-17321 Hygiene facilities and practices.

(1) General.

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

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

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

(2) Shower area.

(a) Where feasible, shower facilities shall be provided which comply with WAC 296-24-12009(3) wherever the

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possibility of employee exposure to airborne levels of MDA in excess of the permissible exposure limit exists.

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

(3) Lunch areas.

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

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

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

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17321, filed 2/3/93, effective 3/15/93.]

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

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

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

(b) The employer shall ensure that labels or other appropriate forms of warning are provided for containers of MDA within the workplace. The labels shall comply with the requirements of WAC 296-62-05411 and shall include one of the following legends:

(i) For pure MDA

DANGER CONTAINS MDA MAY CAUSE CANCER LIVER TOXIN

(ii) For mixtures containing MDA

DANGER CONTAINS MDA CONTAINS MATERIALS
WHICH MAY CAUSE CANCER LIVER TOXIN

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

(3) Information and training.

(a) The employer shall provide employees with information and training on MDA, in accordance with WAC 296-62-054 through 296-62-05415, at the time of initial assignment and at least annually thereafter.

(b) In addition to the information required under WAC 296-62-054, the employer shall:

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

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

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

(4) Access to training materials.

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

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

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17323, filed 2/3/93, effective 3/15/93.]

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(2) Initial examinations.

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

A detailed history which includes:

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

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

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

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

(v) Laboratory tests including:

(A) Liver function tests; and

(B) Urinalysis.

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

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

(3) Periodic examinations.

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

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

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

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

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

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

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

(6) Multiple physician review mechanism.

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

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

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

(b) The employer shall promptly notify an employee of the right to seek a second medical opinion after each occasion that an initial physician conducts a medical examination or consultation pursuant to this section. The employer may condition its participation in, and payment for, the multiple physician review mechanism upon the employee doing the following within 15 days after receipt of the foregoing notification, or receipt of the initial physician's written opinion, whichever is later:

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

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

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

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

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

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

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

(f) Information provided to the examining physician.

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

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

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

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

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

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

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

(g) Physician's written opinion.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(iii) Where a final medical determination results in any recommended special protective measures for an employee,

or limitations on an employee's exposure to MDA, the employer shall implement and act consistent with the recommendation.

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

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

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

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

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

(3) Removal of other employee special protective measure or limitations. The employer shall remove any limitations placed on an employee or end any special protective measures provided to an employee pursuant to a final medical determination when a subsequent final medical determination indicates that the limitations or special protective measures are no longer necessary.

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

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

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

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

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

(5) Medical removal protection benefits.

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

(b) Definition of medical removal protection benefits. For the purposes of this section, the requirement that an employer provide medical removal protection benefits means

that the employer shall maintain the earnings, seniority, and other employment rights and benefits of an employee as though the employee had not been removed from normal exposure to MDA or otherwise limited.

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

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

(e) Other credits. The employer's obligation to provide medical removal protection benefits to a removed employee shall be reduced to the extent that the employee receives compensation for earnings lost during the period of removal either from a publicly or employer-funded compensation program, or receives income from employment with any employer made possible by virtue of the employee's removal.

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

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

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

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

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

(6) Voluntary removal or restriction of an employee. Where an employer, although not required by this section to do so, removes an employee from exposure to MDA or otherwise places limitations on an employee due to the effects of

MDA exposure on the employee's medical condition, the employer shall provide medical removal protection benefits to the employee equal to that required by subsection (5) of this section.

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

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

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

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

(i) The product qualifying for exemption;

(ii) The source of the objective data;

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

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

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

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

(2) Historical monitoring data.

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

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

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

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

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

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

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

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

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

(4) Exposure measurements.

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

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

(i) The date of measurement;

(ii) The operation involving exposure to MDA;

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

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

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

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

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

(5) Medical surveillance.

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

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

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

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

(iii) Physician's written opinions;

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

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

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

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

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

(7) Availability.

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

(b) The employer, upon request, shall make any exposure records required by WAC 296-155-17311 and 296-155-17327 available for examination and copying to affected employees, former employees, designated representatives, and the director, in accordance with WAC 296-62-05201 through 296-62-05209 and 296-62-05213 through 296-62-05223.

(c) The employer, upon request, shall make employee medical records required by WAC 296-155-17327 and this section available for examination and copying to the subject

employee, anyone having the specific written consent of the subject employee, and the director in accordance with chapter 296-62 WAC, Part B.

(8) Transfer of records.

(a) The employer shall comply with the requirements concerning transfer of records set forth in WAC 296-62-05215.

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

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17331, filed 2/3/93, effective 3/15/93.]

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

(2) Observation procedures. When observation of the measuring or monitoring of employee exposure to MDA requires entry into areas where the use of protective clothing and equipment or respirators is required, the employer shall provide the observer with personal protective clothing and equipment or respirators required to be worn by employees working in the area, assure the use of such clothing and equipment or respirators, and require the observer to comply with all other applicable safety and health procedures.

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

WAC 296-155-17335 Effective date. This standard shall become effective on March 15, 1993.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17335, filed 2/3/93, effective 3/15/93.]

WAC 296-155-17337 Appendices. The information contained in Appendices A, B, C, and D of this standard is not intended by itself, to create any additional obligations not otherwise imposed by this standard nor detract from any existing obligation. The protocols for respiratory fit testing in Appendix E of this standard are mandatory.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17337, filed 2/3/93, effective 3/15/93.]

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

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

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

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

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

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

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

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

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

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

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

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

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

(1) Substance identification.

(a) Substance: Methylenedianiline (MDA).

(b) Permissible exposure:

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

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

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

(2) Health hazard data.

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

(b) Effects of overexposure.

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

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

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

(3) Protective clothing and equipment.

(a) Respirators. Respirators are required for those operations in which engineering controls or work practice controls are not adequate or feasible to reduce exposure to the permissible limit. If respirators are worn, they must have the joint Mine Safety and Health Administration and National Institute for Occupational Safety and Health (NIOSH) seal of approval, and cartridges or canisters must be replaced as necessary to maintain the effectiveness of the respirator. If you experience difficulty breathing while wearing a respirator, you may request a positive-pressure respirator from your employer. You must be thoroughly trained to use the

assigned respirator, and the training will be provided by your employer. MDA does not have a detectable odor except at levels well above the permissible exposure limits. Do not depend on odor to warn you when a respirator canister is exhausted. If you can smell MDA while wearing a respirator, proceed immediately to fresh air. If you experience difficulty breathing while wearing a respirator, tell your employer.

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

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

(4) Emergency and first aid procedures.

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

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

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

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

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

(6) Observation of monitoring. Your employer is required to perform measurements that are representative of your exposure to MDA and you or your designated represen-

tative are entitled to observe the monitoring procedure. You are entitled to observe the steps taken in the measurement procedure and to record the results obtained. When the monitoring procedure is taking place in an area where respirators or personal protective clothing and equipment are required to be worn; you and your representative must also be provided with, and must wear, the protective clothing and equipment.

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

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

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

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

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17341, filed 2/3/93, effective 3/15/93.]

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

(a) Substance identification.

(i) Synonyms: CAS No. 101-77-9, 4,4'-methylenedianiline; 4,4'-methylenebisaniiline; methylenedianiline; dianilino-methane.

(ii) Formula: $C_{13}H_{14}N_2$.

(b) Physical data.

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

(a) Molecular weight: 198.26.

(b) Boiling point: 398-399 degrees C. at 760 mm Hg.

(c) Melting point: 88-93 degrees C. (190-100 degrees

F.).

(d) Vapor pressure: 9 mm Hg at 232 degrees C.

(e) Evaporation rate (n-butyl acetate = 1): Negligible.

(f) Vapor density (Air = 1): Not applicable.

(g) Volatile fraction by weight: Negligible.

(h) Specific gravity (Water = 1): Slight.

(i) Heat of combustion: -8.40 kcal/g.

(j) Solubility in water: Slightly soluble in cold water, very soluble in alcohol, benzene, ether, and many organic solvents.

(3) Fire, explosion, and reactivity hazard data.

(a) Flash point: 190 degrees C. (374 degrees F.) Set-aflash closed cup.

(b) Flash point: 226 degrees C. (439 degrees F.) Cleveland open cup.

(c) Extinguishing media: Water spray; dry chemical; carbon dioxide.

(d) Special fire fighting procedures: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

(e) Unusual fire and explosion hazards: Fire or excessive heat may cause production of hazardous decomposition products.

(4) Reactivity data.

(1999 Ed.)

(a) Stability: Stable.

(b) Incompatibility: Strong oxidizers.

(c) Hazardous decomposition products: As with any other organic material, combustion may produce carbon monoxide. Oxides of nitrogen may also be present.

(d) Hazardous polymerization: Will not occur.

(5) Spill and leak procedures.

(a) Sweep material onto paper and place in fiber carton.

(b) Package appropriately for safe feed to an incinerator or dissolve in compatible waste solvents prior to incineration.

(c) Dispose of in an approved incinerator equipped with afterburner and scrubber or contract with licensed chemical waste disposal service.

(d) Discharge treatment or disposal may be subject to federal, state, or local laws.

(e) Wear appropriate personal protective equipment.

(6) Special storage and handling precautions.

(a) High exposure to MDA can occur when transferring the substance from one container to another. Such operations should be well ventilated and good work practices must be established to avoid spills.

(b) Pure MDA is a solid with a low vapor pressure. Grinding or heating operations increase the potential for exposure.

(c) Store away from oxidizing materials.

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

(7) Housekeeping and hygiene facilities.

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

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

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

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

WAC 296-155-17345 Appendix C to WAC 296-155-173—Medical surveillance guidelines for MDA. (1) Route of entry. Inhalation; skin absorption; ingestion. MDA can be inhaled, absorbed through the skin, or ingested.

(2) Toxicology. MDA is a suspect carcinogen in humans. There are several reports of liver disease in humans and animals resulting from acute exposure to MDA. A well documented case of an acute cardiomyopathy secondary to exposure to MDA is on record. Numerous human cases of hepatitis secondary to MDA are known. Upon direct contact MDA may also cause damage to the eyes. Dermatitis and skin sensitization have been observed. Almost all forms of acute environmental hepatic injury in humans involve the hepatic parenchyma and produce hepatocellular jaundice. This agent produces intrahepatic cholestasis. The clinical picture consists of cholestatic jaundice, preceded or accompanied by

abdominal pain, fever, and chills. Onset in about 60% of all observed cases is abrupt with severe abdominal pain. In about 30% of observed cases, the illness presented and evolved more slowly and less dramatically, with only slight abdominal pain. In about 10% of the cases only jaundice was evident. The cholestatic nature of the jaundice is evident in the prominence of itching, the histologic predominance of bile stasis, and portal inflammatory infiltration, accompanied by only slight parenchymal injury in most cases, and by the moderately elevated transaminase values. Acute, high doses, however, have been known to cause hepatocellular damage resulting in elevated SGPT, SGOT, alkaline phosphatase, and bilirubin. Absorption through the skin is rapid. MDA is metabolized and excreted over a 48-hour period. Direct contact may be irritating to the skin, causing dermatitis. Also MDA which is deposited on the skin is not thoroughly removed through washing. MDA may cause bladder cancer in humans. Animal data supporting this assumption is not available nor is conclusive human data. However, human data collected on workers at a helicopter manufacturing facility where MDA is used suggests a higher incidence of bladder cancer among exposed workers.

(3) Signs and symptoms. Skin may become yellow from contact with MDA. Repeated or prolonged contact with MDA may result in recurring dermatitis (red-itchy, cracked skin) and eye irritation. Inhalation, ingestion, or absorption through the skin at high concentrations may result in hepatitis, causing symptoms such as fever and chills, nausea and vomiting, dark urine, anorexia, rash, right upper quadrant pain, and jaundice. Corneal burns may occur when MDA is splashed in the eyes.

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

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

WAC 296-155-17347 Appendix D to WAC 296-155-173—Sampling and analytical methods for MDA monitoring and measurement procedures. Measurements taken for the purpose of determining employee exposure to MDA are best taken so that the representative average 8-hour exposure may be determined from a single 8-hour sample or two 4-hour samples. Short-time interval samples (or grab samples) may also be used to determine average exposure level if a minimum of five measurements are taken in a random manner over the 8-hour work shift. Random sampling means that any portion of the work shift has the same chance of being sampled as any other. The arithmetic average of all such random samples taken on one work shift is an estimate of an employee's average level of exposure for that work shift. Air samples should be taken in the employee's breathing zone (air that would most nearly represent that inhaled by the employee). There are a number of methods available for monitoring

employee exposures to MDA. The method OSHA currently uses is included below. The employer however has the obligation of selecting any monitoring method which meets the accuracy and precision requirements of the standard under her or his unique field conditions. The standard requires that the method of monitoring must have an accuracy, to a 95 percent confidence level, of not less than plus or minus 25 percent for the select PEL.

WISHA methodology.

Sampling procedure.

Apparatus:

Samples are collected by use of a personal sampling pump that can be calibrated within +/-5% of the recommended flow rate with the sampling filter in line. Samples are collected on 37 mm Gelman type A/E glass fiber filters treated with sulfuric acid. The filters are prepared by soaking each filter with 0.5 mL of 0.26N H₂SO₄. (0.26 N H₂SO₄ can be prepared by diluting 1.5 mL of 36N H₂SO₄ to 200 mL with deionized water.) The filters are dried in an oven at 100 degrees C. for one hour and then assembled into three-piece 37 mm polystyrene cassettes without backup pads. The front filter is separated from the back filter by a polystyrene spacer. The cassettes are sealed with shrink bands and the ends are plugged with plastic plugs. After sampling, the filters are carefully removed from the cassettes and individually transferred to small vials containing approximately 2 mL deionized water. The vials must be tightly sealed. The water can be added before or after the filters are transferred. The vials must be sealable and capable of holding at least 7 mL of liquid. Small glass scintillation vials with caps containing Teflon liners are recommended.

Reagents:

Deionized water is needed for addition to the vials.

Sampling technique:

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

Retention efficiency:

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

Extraction efficiency:

The average extraction efficiency for six filters spiked at the target concentration is 99.6%. The stability of extracted and derivatized samples was verified by reanalyzing the above six samples the next day using fresh standards. The average extraction efficiency for the reanalyzed samples is 98.7%.

Recommended air volume and sampling rate. The recommended air volume is 100 L. The recommended sampling rate is 1 L/min.

Interferences (sampling):

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

Safety precautions (sampling):

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

Analytical procedure:

Apparatus:

The following are required for analysis. A GC equipped with an electron capture detector. For this evaluation a Hewlett Packard 5880 Gas Chromatograph equipped with a Nickel 63 High Temperature Electron Capture Detector and a Linearizer was used. A GC column capable of separating the MDA derivative from the solvent and interferences. A 6 ft x 2 mm ID glass column packed with 3% OV-101 coated on 100/120 Gas Chrom Q or a 25 meter DB-1 or DB-5 capillary column is recommended for this evaluation. An electronic integrator or some other suitable means of measuring peak areas or heights. Small resealable vials with Teflon-lined caps capable of holding 4 mL. A dispenser or pipet for toluene capable of delivering 2.9 mL. Pipets (or repipets with plastic or Teflon tips) capable of delivering 1 mL for the sodium hydroxide and buffer solutions. A repipet capable of delivering 25 micro-L HFAA. Syringes for preparation of standards and injection of standards and samples into a GC. Volumetric flasks and pipets to dilute the pure MDA in preparation of standards. Disposable pipets to transfer the toluene layers after the samples are extracted.

Reagents:

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

Standard preparation:

Concentrated stock standards are prepared by diluting pure MDA with toluene. Analytical standards are prepared by injecting micro-L amounts of diluted stock standards into vials that contain 2.0 mL toluene. 25 micro-L HFAA are added to each vial and the vials are capped and shaken for 10 seconds. After 10 min, 1 mL of buffer is added to each vial. The vials are recapped and shaken for 10 seconds. After allowing the layers to separate, aliquots of the toluene (upper) layers are removed with a syringe and analyzed by GC. Ana-

lytical standard concentrations should bracket sample concentrations. Thus, if samples fall out of the range of prepared standards, additional standards must be prepared to ascertain detector response.

Sample preparation:

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

Analysis:

GC conditions.

Zone temperatures: Column—220 degrees C. Injector—235 degrees C. Detector—335 degrees C. Gas flows, N₂ Column—30 mL/min He Purge—Column 0.9 mL/min. (capillary) with 30 mL/min. ArCH₄ (95/5) make up gas Injection volume: 5.0 uL Column: 6 ft x 1/8 in ID glass, 3% OV-101 on 100/120 Gas Chrom Q or 25 Retention time of MDA derivative: 2.5 to 3.5, depending on column and flow.

Chromatogram. Peak areas or heights are measured by an integrator or other suitable means. A calibration curve is constructed by plotting response (peak areas or heights) of standard injections versus micro-g of MDA per sample. Sample concentrations must be bracketed by standards.

Interferences (analytical):

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

Calculations:

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

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

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

WAC 296-155-17349 Appendix E to WAC 296-155-173—Methylenedianiline—Qualitative and quantitative fit testing procedures.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17349, filed 2/3/93, effective 3/15/93.]

WAC 296-155-17351 Appendix E-1—Qualitative protocols.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17351, filed 2/3/93, effective 3/15/93.]

WAC 296-155-17353 Appendix E-1-a—Isoamyl acetate (banana oil) protocol. (1) Odor threshold screening.

(a) Three 1-liter glass jars with metal lids (e.g. Mason or Ball jars) are required.

(b) Odor-free water (e.g., distilled or spring water) at approximately 25 deg. C. shall be used for the solutions.

(c) The isoamyl acetate (IAA) (also known as isopentyl acetate) stock solution is prepared by adding 1 cc of pure IAA to 800 cc of odor-free water in a 1-liter jar and shaking for 30 seconds. This solution shall be prepared new at least weekly.

(d) The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well ventilated so that circulation of the test solution does not occur and cross contaminate the different testing sites.

(e) The odor test solution is prepared in a second jar by placing 0.4 cc of the stock solution into 500 cc of odor-free water using a clean dropper or pipette. Shake for 30 seconds and allow to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution may be used for only one day.

(f) A test blank is prepared in a third jar by adding 500 cc of odor-free water.

(g) The odor test and test blank jars shall be labelled 1 and 2 for jar identification. The following instructions shall be typed on a card and placed on the table in front of the two test jars (i.e., 1 and 2): "The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."

(h) The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.

(i) If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test may not be used.

(j) If the test subject correctly identifies the jar containing the odor test solution, the test subject may proceed to respirator selection and fit testing.

(2) Respirator selection.

(a) The test subject shall be allowed to pick the most comfortable respirator from a selection including respirators of various sizes from different manufacturers. The selection shall include at least three sizes of elastomeric half facepieces, from at least two manufacturers.

(b) The selection process shall be conducted in a room separate from the fit test chamber to prevent odor fatigue. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension, and how to determine a "com-

fortable" respirator. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This instruction may not constitute the subject's formal training on respirator use, as it is only a review.

(c) The test subject should understand that the employee is being asked to select the respirator which provides the most comfortable fit.

(d) The test subject holds each facepiece up to the face and eliminates those which obviously do not give a comfortable fit. Normally, selection will begin with a half-mask and if a comfortable fit cannot be found, the subject will be asked to test the full facepiece respirators. (A small percentage of users will not be able to wear any half-mask.)

(e) The more comfortable facepieces are noted; the most comfortable mask is donned and worn at least five minutes to assess comfort. All donning and adjustments of the facepiece shall be performed by the test subject without assistance from the test conductor or other person. Assistance in assessing comfort can be given by discussing the points in subdivision (f) below. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

(f) Assessment of comfort shall include reviewing the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator after donning:

- (i) Positioning of mask on nose;
- (ii) Room for eye protection;
- (iii) Room to talk;
- (iv) Positioning mask on face and cheeks.

(g) The following criteria shall be used to help determine the adequacy of the respirator fit:

- (i) Chin properly placed;
- (ii) Strap tension;
- (iii) Fit across nose bridge;
- (iv) Distance from nose to chin;
- (v) Tendency to slip;
- (vi) Self-observation in mirror.

(h) The test subject shall perform the conventional negative-pressure or positive-pressure fit checks (e.g., see ANSI Z88.2-1980A7). Before beginning the negative-pressure or positive-pressure test, the subject shall be told to "seat" the mask by rapidly moving the head from side to side and up and down, while taking a few deep breaths.

(i) The test subject is now ready for fit testing.

(j) After passing the fit test, the test subject shall be questioned again regarding the comfort of the respirator. If the respirator has become uncomfortable, another model of respirator shall be tried.

(k) The employee shall be given the opportunity to select a different facepiece and to be retested if the chosen facepiece becomes increasingly uncomfortable at any time.

(3) Fit test.

(a) The fit test chamber shall be similar to a clear 55 gallon drum liner suspended inverted over a 2-foot diameter frame, so that the top of chamber is about 6 inches above the test subject's head. The inside top center of the chamber shall have a small hook attached.

(b) Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors. The cartridges or canisters shall be replaced as necessary to maintain the effectiveness of the respirator.

(c) After selecting, donning, and properly adjusting a respirator, the test subject shall wear it to the fit testing room. This room shall be separate from the room used for odor threshold screening and respirator selection, and shall be well ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.

(d) A copy of the following test exercises and Rainbow Passage shall be taped to the inside of the test chamber:

(e) Test exercises.

(i) Breathe normally.

(ii) Breathe deeply. Be certain breaths are deep and regular.

(iii) Turn head all the way from one side to the other. Inhale on each side. Be certain movement is complete. Do not bump the respirator against the shoulders.

(iv) Nod head up and down. Inhale when head is in the full up position (looking toward ceiling). Be certain motions are complete and made about every second. Do not bump the respirator on the chest.

(v) Talking. Talk aloud and slowly for several minutes. The following paragraph is called the Rainbow Passage. Reading it aloud will result in a wide range of facial movements, and thus be useful to satisfy this requirement. Alternative passages which serve the same purpose may also be used.

Rainbow Passage:

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(vi) Jog in place.

(vii) Breathe normally.

(f) Each test subject shall wear the respirator for at least 10 minutes before starting the fit test.

(g) Upon entering the test chamber, the test subject shall be given a 6-inch by 5-inch piece of paper towel or other porous absorbent single ply material, folded in half and wetted with three-quarters of one cc of pure IAA. The test subject shall hang the wet towel on the hook at the top of the chamber.

(h) Allow two minutes for the IAA test concentration to be reached before starting the fit test exercises.

(i) Each exercise described in subdivision (e) of this subsection shall be performed for at least one minute.

(j) If at any time during the test, the subject detects the banana-like odor of IAA, the test has failed. The subject shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.

(k) If the test is failed, the subject shall return to the selection room and remove the respirator, repeat the odor

sensitivity test, select and put on another respirator, return to the test chamber, and again begin the procedure described in subdivisions (d) through (j) of this subsection. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject shall wait about 5 minutes before retesting. Odor sensitivity will usually have returned by this time.

(l) If a person cannot pass the fit test described above wearing a half-mask respirator from the available selection, full facepiece models must be used.

(m) When a respirator is found that passes the test, the subject must break the face seal and take a breath before exiting the chamber. This is to assure that the reason the test subject is not smelling the IAA is the good fit of the respirator facepiece seal and not olfactory fatigue.

(n) When the test subject leaves the chamber, the subject shall remove the saturated towel and return it to the person conducting the test. To keep the area from becoming contaminated, the used towels shall be kept in a self-sealing bag so there is no significant IAA concentration buildup in the test chamber during subsequent tests.

(o) Persons who have successfully passed this fit test with a half-mask respirator may be assigned the use of the test respirator in atmospheres with up to 10 times the PEL. In atmospheres greater than 10 times, and less than 50 times the PEL (up to 50 ppm), the subject must pass the IAA test using a full face negative-pressure respirator. (The concentration of the IAA inside the test chamber must be increased by five times for QLFT of the full facepiece.)

(p) The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface.

(q) If hair growth or apparel interfere with a satisfactory fit, then they shall be altered or removed so as to eliminate interference and allow a satisfactory fit. If a satisfactory fit is still not attained, the test subject must use a positive-pressure respirator such as a powered air-purifying respirator, supplied air respirator, or self-contained breathing apparatus.

(r) If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respiratory diseases or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

(s) Qualitative fit testing shall be repeated at least every 12 months.

(t) In addition, because the sealing of the respirator may be affected, qualitative fit testing shall be repeated immediately when the test subject has a:

(i) Weight change of 20 pounds or more;

(ii) Significant facial scarring in the area of the facepiece seal;

(iii) Significant dental changes; i.e., multiple extractions without prosthesis, or acquiring dentures;

(iv) Reconstructive or cosmetic surgery; or

(v) Any other condition that may interfere with facepiece sealing.

(4) Recordkeeping. A summary of all test results shall be maintained by the employer for 3 years. The summary shall include:

(a) Name of test subject.

(b) Date of testing.

(c) Name of the test conductor.

(d) Respirators selected (indicate manufacturer, model, size, and approval number).

(e) Testing agent.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17353, filed 2/3/93, effective 3/15/93.]

WAC 296-155-17355 Appendix E-1-b—Saccharin solution aerosol protocol. (1) Respirator selection. Respirators shall be selected as described in WAC 296-155-17353(2) (respirator selection), except that each respirator shall be equipped with a particulate filter.

(2) Taste threshold screening.

(a) An enclosure placed over the head and shoulders shall be used for threshold screening (to determine if the individual can taste saccharin) and for fit testing. The enclosure shall be approximately 12 inches in diameter by 14 inches tall with at least the front clear to allow free movement of the head when a respirator is worn.

(b) The test enclosure shall have a three-quarter inch hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(c) The entire screening and testing procedure shall be explained to the test subject prior to conducting the screening test.

(d) During the threshold screening test, the test subject shall don the test enclosure and breathe with open mouth with tongue extended.

(e) Using a DeVilbiss Model 40 inhalation medication nebulizer or equivalent, the test conductor shall spray the threshold check solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(f) The threshold check solution consists of 0.83 grams of sodium saccharin, USP in water. It can be prepared by putting 1 cc of the test solution (see C 7 below) in 100 cc of water.

(g) To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then is released and allowed to fully expand.

(h) Ten squeezes of the nebulizer bulb are repeated rapidly and then the test subject is asked whether the saccharin can be tasted.

(i) If the first response is negative, ten more squeezes of the nebulizer bulb are repeated rapidly and the test subject is again asked whether the saccharin can be tasted.

(j) If the second response is negative ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin can be tasted.

(k) The test conductor will take note of the number of squeezes required to elicit a taste response.

(l) If the saccharin is not tasted after 30 squeezes (Step 10), the saccharin fit test cannot be performed on the test subject.

(m) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

(n) Correct use of the nebulizer means that approximately 1 cc of liquid is used at a time in the nebulizer body.

(o) The nebulizer shall be thoroughly rinsed in water, shaken dry, and refilled at least every four hours.

(3) Fit test.

(a) The test subject may not eat, drink (except plain water), or chew gum for 15 minutes before the test.

(b) The test subject shall don and adjust the respirator without assistance from any person.

(c) The fit test uses the same enclosure described in IIB above.

(d) Each test subject shall wear the respirator for at least 10 minutes before starting the fit test.

(i) This would be an appropriate time to talk with the test subject; to explain the fit test, the importance of cooperation, and the purpose for the head exercises; or to demonstrate some of the exercises.

(ii) The test subject shall perform the conventional negative-pressure or positive-pressure fit tests (see ANZI [ANSI] Z88.2 1980 A7).

(e) The test subject shall enter the enclosure while wearing the respirator selected in section IB above. This respirator shall be properly adjusted and equipped with a particulate filter.

(f) A second DeVilbiss Model 40 inhalation medication nebulizer is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(g) The fit test solution is prepared by adding 83 grams of sodium saccharin to 100 cc of warm water.

(h) As before, the test subject shall breathe with mouth open and tongue extended.

(i) The nebulizer is inserted into the hole in the front of the enclosure and the fit test solution is sprayed into the enclosure using the same technique as for the taste threshold screening and the same number of squeezes required to elicit a taste response in the screening. (See B8 through B10 above.)

(j) After generation of the aerosol read the following instructions to the test subject. The test subject shall perform the exercises for one minute each.

(i) Breathe normally.

(ii) Breathe deeply. Be certain breaths are deep and regular.

(iii) Turn head all the way from one side to the other. Be certain movement is complete. Inhale on each side. Do not bump the respirator against the shoulders.

(iv) Nod head up and down. Be certain motions are complete. Inhale when head is in the full up position (when looking toward the ceiling). Do not bump the respirator on the chest.

(v) Talk. Talk aloud and slowly. The following paragraph is called the Rainbow Passage. Reading it will result in a wide range of facial movements, and thus be useful to satisfy this requirement.

Rainbow Passage:

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach,

his friends say he is looking for the pot of gold at the end of the rainbow.

(vi) Jog in place.

(vii) Breathe normally.

(k) At the beginning of each exercise, the aerosol concentration shall be replenished using one-half the number of squeezes as initially described in C9.

(l) The test subject shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected.

(m) If the saccharin is detected the fit is deemed unsatisfactory and a different respirator shall be tried.

(n) Successful completion of the test protocol shall allow the use of the half-mask tested respirator in contaminated atmospheres up to 10 times the PEL of MDA. In other words this protocol may not be used to assign protection factors no higher than ten.

(o) The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface.

(p) If hair growth or apparel interfere with a satisfactory fit, then they shall be altered or removed so as to eliminate interference and allow a satisfactory fit. If a satisfactory fit is still not attained, the test subject must use a positive-pressure respirator such as powered air-purifying respirators, supplied-air respirator, or self-contained breathing apparatus.

(q) If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respirator diseases or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

(r) Qualitative fit testing shall be repeated at least every 12 months.

(s) In addition, because the sealing of the respirator may be affected, qualitative fit testing shall be repeated immediately when the test subject has a:

(i) Weight change of 20 pounds or more;

(ii) Significant facial scarring in the area of the facepiece seal;

(iii) Significant dental changes; i.e., multiple extractions without prosthesis, or acquiring dentures;

(iv) Reconstructive or cosmetic surgery; or

(v) Any other condition that may interfere with facepiece sealing.

(4) Recordkeeping. A summary of all test results shall be maintained by the employer for 3 years. The summary shall include:

(a) Name of test subject.

(b) Date of testing.

(c) Name of test conductor.

(d) Respirators selected (indicate manufacturer, model, size, and approval number).

(e) Testing agent.

[Statutory Authority: Chapter 49.17 RCW, 93-04-111 (Order 92-15), § 296-155-17355, filed 2/3/93, effective 3/15/93.]

WAC 296-155-17357 Appendix E-1-c—Irritant fume protocol. (1) Respirator selection. Respirators shall be selected as described in section IB above, except that each respirator shall be equipped with a combination of high-efficiency and acid-gas cartridges.

(1999 Ed.)

(2) Fit test.

(a) The test subject shall be allowed to smell a weak concentration of the irritant smoke to familiarize the subject with the characteristic odor.

(b) The test subject shall properly don the respirator selected as above, and wear it for at least 10 minutes before starting the fit test.

(c) The test conductor shall review this protocol with the test subject before testing.

(d) The test subject shall perform the conventional positive-pressure and negative-pressure fit checks (see ANSI Z88.2 1980). Failure of either check shall be cause to select an alternate respirator.

(e) Break both ends of a ventilation smoke tube containing stannic oxychloride, such as the MSA part #5645, or equivalent. Attach a short length of tubing to one end of the smoke tube. Attach the other end of the smoke tube to a low-pressure air pump set to deliver 200 milliliters per minute.

(f) Advise the test subject that the smoke can be irritating to the eyes and instruct the subject to keep the eyes closed while the test is performed.

(g) The test conductor shall direct the stream of irritant smoke from the tube towards the facepiece area of the test subject. The person conducting the test shall begin with the tube at least 12 inches from the facepiece and gradually move to within one inch, moving around the whole perimeter of the mask.

(h) The test subject shall be instructed to do the following exercises while the respirator is being challenged by the smoke. Each exercise shall be performed for one minute.

(i) Breathe normally.

(ii) Breathe deeply. Be certain breaths are deep and regular.

(iii) Turn head all the way from one side to the other. Be certain movement is complete. Inhale on each side. Do not bump the respirator against the shoulders.

(iv) Nod head up and down. Be certain motions are complete and made every second. Inhale when head is in the full up position (looking toward ceiling). Do not bump the respirator against the chest.

(v) Talking. Talk aloud and slowly for several minutes. The following paragraph is called the Rainbow Passage. Reading it will result in a wide range of facial movements, and thus be useful to satisfy this requirement. Alternative passages which serve the same purpose may also be used.

Rainbow Passage:

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(vi) Jogging in place.

(vii) Breathe normally.

(i) The test subject shall indicate to the test conductor if the irritant smoke is detected. If smoke is detected, the test

[Title 296 WAC—p. 2103]

conductor shall stop the test. In this case, the tested respirator is rejected and another respirator shall be selected.

(j) Each test subject passing the smoke test (i.e., without detecting the smoke) shall be given a sensitivity check of smoke from the same tube to determine if the test subject reacts to the smoke. Failure to evoke a response shall void the fit test.

(k) Steps (2)(d), (i), and (j) of this fit test protocol shall be performed in a location with exhaust ventilation sufficient to prevent general contamination of the testing area by the test agents.

(l) Respirators successfully tested by the protocol may be used in contaminated atmospheres up to ten times the PEL of MDA.

(m) The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface.

(n) If hair growth or apparel interfere with a satisfactory fit, then they shall be altered or removed so as to eliminate interference and allow a satisfactory fit. If a satisfactory fit is still not attained, the test subject must use a positive-pressure respirator such as powered air-purifying respirators, supplied-air respirator, or self-contained breathing apparatus.

(o) If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respirator diseases or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

(p) Qualitative fit testing shall be repeated at least every 12 months.

(q) In addition, because the sealing of the respirator may be affected, qualitative fit testing shall be repeated immediately when the test subject has a:

(i) Weight change of 20 pounds or more;

(ii) Significant facial scarring in the area of the facepiece seal;

(iii) Significant dental changes; i.e., multiple extractions without prosthesis, or acquiring dentures;

(iv) Reconstructive or cosmetic surgery; or

(v) Any other condition that may interfere with facepiece sealing.

(3) Recordkeeping. A summary of all test results shall be maintained by the employer for 3 years. The summary shall include:

(a) Name of test subject.

(b) Date of testing.

(c) Name of test conductor.

(d) Respirators selected (indicate manufacturer, model, size, and approval number).

(e) Testing agent.

[Statutory Authority: Chapter 49.17 RCW. 93-04-111 (Order 92-15), § 296-155-17357, filed 2/3/93, effective 3/15/93.]

WAC 296-155-17359 Appendix E-2—Quantitative fit test procedures. (1) General.

(a) The method applies to the negative-pressure nonpowered air-purifying respirators only.

(b) The employer shall assign an individual (with help as needed) who shall assume the full responsibility for implementing the respirator quantitative fit test program.

(2) Definition.

(a) "Quantitative fit test" means the measurement of the effectiveness of a respirator seal in excluding the ambient atmosphere. The test is performed by dividing the measured concentration of challenge agent in a test chamber by the measured concentration of the challenge agent inside the respirator facepiece when the normal air-purifying element has been replaced by an essentially perfect purifying element.

(b) "Challenge agent" means the air contaminant introduced into a test chamber so that its concentration inside and outside the respirator may be compared.

(c) "Test subject" means the person wearing the respirator for quantitative fit testing.

(d) "Normal standing position" means standing erect and straight with arms down along the sides and looking straight ahead.

(e) "Fit factor" means the ratio of challenge agent concentration outside with respect to the inside of a respirator inlet covering (facepiece or enclosure).

(3) Apparatus.

(a) Instrumentation. Corn oil, sodium chloride, or other appropriate aerosol generation, dilution, and measurement systems shall be used for quantitative fit test.

(b) Test chamber. The test chamber shall be large enough to permit all test subjects to freely perform all required exercises without distributing the challenge agent concentration or the measurement apparatus. The test chamber shall be equipped and constructed so that the challenge agent is effectively isolated from the ambient air yet uniform in concentration throughout the chamber.

(c) When testing air-purifying respirators, the normal filter or cartridge element shall be replaced with a high-efficiency particulate filter supplied by the same manufacturer.

(d) The sampling instrument shall be selected so that a strip chart record may be made of the test showing the rise and fall of challenge agent concentration with each inspiration and expiration at fit factors of at least 2,000.

(e) The combination of substitute air-purifying elements (if any), challenge agent, and challenge agent concentration in the test chamber shall be such that the test subject is not exposed in excess of PEL to the challenge agent at any time during the testing process.

(f) The sampling port on the test specimen respirator shall be placed and constructed so that there is no detectable leak around the port, a free air flow is allowed into the sampling line at all times, and so there is no interference with the fit or performance of the respirator.

(g) The test chamber and test set-up shall permit the person administering the test to observe one test subject inside the chamber during the test.

(h) The equipment generating the challenge atmosphere shall maintain the concentration of challenge agent constant within a 10 percent variation for the duration of the test.

(i) The time lag (interval between an event and its being recorded on the strip chart) of the instrumentation may not exceed 2 seconds.

(j) The tubing for the test chamber atmosphere and for the respirator sampling port shall be the same diameter, length, and material. It shall be kept as short as possible. The smallest diameter tubing recommended by the manufacturer shall be used.

(k) The exhaust flow from the test chamber shall pass through a high-efficiency filter before release to the room.

(l) When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed 50 percent.

(4) Procedural requirements.

(a) The fitting of half-mask respirators should be started with those having multiple sizes and a variety of interchangeable cartridges and canisters such as the MSA Comfr II-M, Norton M, Survivair M A- O M, or Scott-M. Use either of the tests outlined below to assure that the facepiece is properly adjusted.

(i) Positive-pressure test. With the exhaust port(s) blocked the negative pressure of slight inhalation should remain constant for several seconds.

(ii) Negative-pressure test. With the intake port(s) blocked the negative pressure slight inhalation should remain constant for several seconds.

(b) After a facepiece is adjusted, the test subject shall wear the facepiece for at least 5 minutes before conducting a qualitative test by using either of the methods described below and using the exercise regime described in subsection (5)(a) through (e) of this section.

(i) Isoamyl acetate test. When using organic vapor cartridges, the test subject who can smell the odor should be unable to detect the odor of isoamyl acetate squirted into the air near the most vulnerable portions of the facepiece seal. In a location which is separated from the test area, the test subject shall be instructed to close her/his eyes during the test period. A combination cartridge or canister with organic vapor and high-efficiency filters shall be used when available for the particular mask being tested. The test subject shall be given an opportunity to smell the odor of isoamyl acetate before the test is conducted.

(ii) Irritant fume test. When using high-efficiency filters, the test subject should be unable to detect the odor of irritant fume (stannic chloride or titanium tetrachloride ventilation smoke tubes) squirted into the air near the most vulnerable portions of the facepiece seal. The test subject shall be instructed to close her/his eyes during the test period.

(c) The test subject may enter the quantitative testing chamber only if she or he has obtained a satisfactory fit as stated in subdivision (b) of this subsection.

(d) Before the subject enters the test chamber, a reasonably stable challenge agent concentration shall be measured in the test chamber.

(e) Immediately after the subject enters the test chamber, the challenge agent concentration inside the respirator shall be measured to ensure that the peak penetration does not exceed 5 percent for a half-mask and 1 percent for a full facepiece.

(f) A stable challenge agent concentration shall be obtained prior to the actual start of testing.

(g) Respirator restraining straps may not be overtightened for testing. The straps shall be adjusted by the wearer to give a reasonably comfortable fit typical of normal use.

(5) Exercise regime. Prior to entering the test chamber, the test subject shall be given complete instructions as to her/his part in the test procedures. The test subject shall perform the following exercises, in the order given, for each independent test.

(a) Normal breathing (NB). In the normal standing position, without talking, the subject shall breathe normally for at least one minute.

(b) Deep breathing (DB). In the normal standing position the subject shall do deep breathing for at least one minute pausing so as not to hyperventilate.

(c) Turning head side to side (SS). Standing in place the subject shall slowly turn her or his head from side to side between the extreme positions to each side. The head shall be held at each extreme position for at least 5 seconds. Perform for at least five complete cycles.

(d) Moving head up and down (UD). Standing in place, the subject shall slowly move her or his head up and down between the extreme position straight up and the extreme position straight down. The head shall be held at each extreme position for at least 5 seconds. Perform for at least five complete cycles.

(e) Reading (R). The subject shall read out slowly and loud so as to be heard clearly by the test conductor or monitor. The test subject shall read the "Rainbow Passage" at the end of this section.

(f) Grimace (G). The test subject shall grimace, smile, frown, and generally contort the face using the facial muscles. Continue for at least 15 seconds.

(g) Bend over and touch toes (B). The test subject shall bend at the waist and touch toes and return to upright position. Repeat for at least one minute.

(h) Jogging in place (J). The test subject shall jog in place for at least one minute.

(i) Normal breathing (NB). In the normal standing position, without talking, the subject shall breathe normally for at least one minute.

Rainbow Passage:

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(6) Termination of tests. The test shall be terminated whenever any single peak penetration exceeds 5 percent for half-masks and 1 percent for full facepieces. The test subject may be refitted and retested. If two of the three required tests are terminated, the fit shall be deemed inadequate.

(7) Calculation of fit factors.

(a) The fit factor determined by the quantitative fit test equals the average concentration inside the respirator.

(b) The average test chamber concentration is the arithmetic average of the test chamber concentration at the beginning and at the end of the test.

(c) The average peak concentration of the challenge agent inside the respirator shall be the arithmetic average peak concentrations for each of the nine exercises of the test which are computed as the arithmetic average of the peak concentrations found for each breath during the exercise.

(d) The average peak concentration for an exercise may be determined graphically if there is not a great variation in the peak concentrations during a single exercise.

(8) Interpretation of test results. The fit factor measured by the quantitative fit testing shall be the lowest of the three protection factors resulting from three independent tests.

(9) Other requirements.

(a) The test subject shall not be permitted to wear a half-mask or full facepiece if the minimum fit factor of 250 or 1,250, respectively, cannot be obtained. If hair growth or apparel interfere with a satisfactory fit, then they shall be altered or removed so as to eliminate interference and allow a satisfactory fit. If a satisfactory fit is still not attained, the test subject must use a positive-pressure respirator such as powered air-purifying respirators, supplied-air respirator, or self-contained breathing apparatus.

(b) The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface.

(c) If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician to determine whether the test subject can wear a respirator while performing her or his duties.

(d) The test subject shall be given the opportunity to wear the assigned respirator for one week. If the respirator does not provide a satisfactory fit during actual use, the test subject may request another QNFT which shall be performed immediately.

(e) A respirator fit factor card shall be issued to the subject with the following information:

(i) Name.

(ii) Date of fit test.

(iii) Protection factors obtained through each manufacturer, model and approval number of respirator tested.

(iv) Name and signature of the person that conducted the test.

(f) Filters used for qualitative or quantitative fit testing shall be replaced weekly, whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media. Organic vapor cartridges/canisters shall be replaced daily or sooner if there is any indication of breakthrough by the test agent.

(10) Retesting. In addition, because the sealing of the respirator may be affected, quantitative fit testing shall be repeated immediately when the test subject has a:

(a) Weight change of 20 pounds or more;

(b) Significant facial scarring in the area of the facepiece seal;

(c) Significant dental changes; i.e., multiple extractions without prosthesis, or acquiring dentures;

(d) Reconstructive or cosmetic surgery; or

(e) Any other condition that may interfere with facepiece sealing.

(11) Recordkeeping.

(a) A summary of all test results shall be maintained for three years. The summary shall include:

(i) Name of test subject.

(ii) Date of testing.

(iii) Name of the test conductor.

(iv) Fit factors obtained from every respirator tested (indicate manufacturer, model, size, and approval number).

(b) A copy of all test data including the strip chart and results shall be kept for at least five years.

[Statutory Authority: Chapter 49.17 RCW, 93-04-111 (Order 92-15), § 296-155-17359, filed 2/3/93, effective 3/15/93.]

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

(a) Wrecking, demolition, or salvage of structures where cadmium or materials containing cadmium are present;

(b) Use of cadmium containing-paints and cutting, brazing, burning, grinding, or welding on surfaces that were painted with cadmium-containing paints;

(c) Construction, alteration, repair, maintenance, or renovation of structures, substrates, or portions thereof, that contain cadmium, or materials containing cadmium;

(d) Cadmium welding; cutting and welding cadmium-plated steel; brazing or welding with cadmium alloys;

(e) Installation of products containing cadmium;

(f) Electrical grounding with cadmium-welding, or electrical work using cadmium-coated conduit;

(g) Maintaining or retrofitting cadmium-coated equipment;

(h) Cadmium contamination/emergency cleanup; and

(i) Transportation, disposal, storage, or containment of cadmium or materials containing cadmium on the site or location at which construction activities are performed.

(2) Definitions.

(a) Action level (AL) is defined as an airborne concentration of cadmium of 2.5 micrograms per cubic meter of air ($2.5 \mu\text{g}/\text{m}^3$), calculated as an 8-hour time-weighted average (TWA).

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

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

standard are implemented, maintained in proper operating condition, and functioning properly.

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

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

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

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

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

(i) This section means this cadmium standard.

(3) Permissible exposure limit (PEL). The employer shall assure that no employee is exposed to an airborne concentration of cadmium in excess of five micrograms per cubic meter of air ($5 \mu\text{g}/\text{m}^3$), calculated as an 8-hour time-weighted average exposure (TWA).

(4) Exposure monitoring

(a) General.

(i) Prior to the performance of any construction work where employees may be potentially exposed to cadmium, the employer shall establish the applicability of this standard by determining whether cadmium is present in the workplace and whether there is the possibility that employee exposures will be at or above the action level. The employer shall designate a competent person who shall make this determination. Investigation and material testing techniques shall be used, as appropriate, in the determination. Investigation shall include a review of relevant plans, past reports, material safety data sheets, and other available records, and consultations with the property owner and discussions with appropriate individuals and agencies.

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

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

(iv) Eight-hour TWA exposures shall be determined for each employee on the basis of one or more personal breathing-zone air samples reflecting full shift exposure on each shift, for each job classification, in each work area. Where several employees perform the same job tasks, in the same job classification, on the same shift, in the same work area, and the length, duration, and level of cadmium exposures are

similar, an employer may sample a representative fraction of the employees instead of all employees in order to meet this requirement. In representative sampling, the employer shall sample the employee(s) expected to have the highest cadmium exposures.

(b) Specific.

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

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

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

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

(c) Monitoring frequency (periodic monitoring).

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

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

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

(e) Employee notification of monitoring results.

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

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

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

(5) Regulated areas.

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

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

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

(d) Provision of respirators. Each person entering a regulated area shall be supplied with and required to use a respirator, selected in accordance with subsection (7)(b) of this section.

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

(6) Methods of compliance.

(a) Compliance hierarchy.

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

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

(A) The employee is only intermittently exposed; and

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

(iii) Wherever engineering and work practice controls are not sufficient to reduce employee exposure to or below the PEL, the employer nonetheless shall implement such controls to reduce exposures to the lowest levels achievable. The employer shall supplement such controls with respiratory

protection that complies with the requirements of subsection (7) of this section and the PEL.

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

(b) Specific operations.

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

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

(c) Prohibitions.

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

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

(d) Mechanical ventilation.

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

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

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

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

(e) Compliance program.

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

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

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

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

(7) Respirator protection.

(a) General. Where respirators are required by this section, the employer shall provide them at no cost to the employee and shall assure that they are used in compliance with the requirements of this section. Respirators shall be used in the following circumstances:

(i) Where exposure levels exceed the PEL, during the time period necessary to install or implement feasible engineering and work practice controls;

(ii) In those maintenance and repair activities and during those brief or intermittent operations where exposures exceed the PEL and engineering and work practice controls are not feasible, or are not required;

(iii) In regulated areas, as prescribed in subsection (5) of this section;

(iv) Where the employer has implemented all feasible engineering and work practice controls and such controls are not sufficient to reduce exposures to or below the PEL;

(v) In emergencies;

(vi) Wherever an employee who is exposed to cadmium at or above the action level requests a respirator; and

(vii) Wherever an employee is exposed to cadmium above the PEL and engineering controls are not required under (a)(ii) of this subsection.

(b) Respirator selection.

(i) Where respirators are required under this section, the employer shall select and provide the appropriate respirator as specified in Table 1. The employer shall select respirators from among those jointly approved as acceptable protection against cadmium dust, fume, and mist by the Mine Safety and Health Administration (MSHA) and by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11.

Table 1

Airborne concentration or condition of use ^a	Required respirator type ^b
50 x or less	A full facepiece air-purifying respirator equipped with a HEPA filter, or a powered air-purifying respirator with a tight-fitting half-mask equipped with a HEPA filter, or a supplied air respirator with a tight-fitting half-mask operated in the continuous flow mode.
250 x or less	A powered air-purifying respirator with a tight-fitting full facepiece equipped with a HEPA filter, or a supplied-air respirator with a tight-fitting full facepiece operated in the continuous flow mode.
1000 x or less	A supplied-air respirator with half-mask or full facepiece operated in the pressure demand or other positive pressure mode.
>1000 x or unknown concentrations	A self-contained breathing apparatus with a full facepiece operated in the pressure demand or other positive pressure mode, or a supplied-air respirator with a full facepiece operated in the pressure demand or other positive pressure mode and equipped with an auxiliary escape type self-contained breathing apparatus operated in the pressure demand mode.
Fire fighting	A self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

Note: ^a Concentrations expressed as multiple of the PEL.

^b Respirators assigned for higher environmental concentrations may be used at lower exposure levels. Quantitative fit testing is required for all tight-fitting air purifying respirators where airborne concentration of cadmium exceeds 10 times the TWA PEL ($10 \times 5 \mu\text{g}/\text{m}^3 = 50 \mu\text{g}/\text{m}^3$). A full facepiece respirator is required when eye irritation is experienced.

^c HEPA means High Efficiency Particulate Air.

^d Fit testing, qualitative or quantitative, is required.

Source: Respiratory Decision Logic, NIOSH, 1987.

(ii) The employer shall provide a powered, air-purifying respirator (PAPR) in lieu of a negative pressure respirator wherever:

(A) An employee entitled to a respirator chooses to use this type of respirator; and

(B) This respirator will provide adequate protection to the employee.

Table 1

Respiratory Protection for Cadmium

Airborne concentration or condition of use ^a	Required respirator type ^b
10 x or less	A half-mask, air-purifying respirator equipped with a HEPA ^c filter. ^d
25 x or less	A powered air-purifying respirator ("PAPR") with a loose-fitting hood or helmet equipped with a HEPA filter, or a supplied-air respirator with a loose-fitting hood or helmet facepiece operated in the continuous flow mode.

(c) Respirator program.

(i) Where respiratory protection is required, the employer shall institute a respirator protection program in accordance with chapter 296-62 WAC, Part E.

(ii) The employer shall permit each employee who is required to use an air purifying respirator to leave the regulated area to change the filter elements or replace the respirator whenever an increase in breathing resistance is detected and shall maintain an adequate supply of filter elements for this purpose.

(iii) The employer shall also permit each employee who is required to wear a respirator to leave the regulated area to wash his or her face and the respirator facepiece whenever necessary to prevent skin irritation associated with respirator use.

(iv) If an employee exhibits difficulty in breathing while wearing a respirator during a fit test or during use, the employer shall make available to the employee a medical examination in accordance with subsection (12)(f)(ii) of this section to determine if the employee can wear a respirator while performing the required duties.

(v) No employee shall be assigned a task requiring the use of a respirator if, based upon his or her most recent examination, an examining physician determines that the employee will be unable to continue to function normally while wearing a respirator. If the physician determines the employee must be limited in, or removed from his or her current job because of the employee's inability to wear a respirator, the limitation or removal shall be in accordance with subsection (12)(k) and (l) of this section.

(d) Respirator fit testing.

(i) The employer shall assure that the respirator issued to the employee is fitted properly and exhibits the least possible facepiece leakage.

(ii) For each employee wearing a tight-fitting, air purifying respirator (either negative or positive pressure) who is exposed to airborne concentrations of cadmium that do not exceed 10 times the PEL ($10 \times 5 \mu\text{g}/\text{m}^3 = 50 \mu\text{g}/\text{m}^3$), the employer shall perform either quantitative or qualitative fit testing at the time of initial fitting and at least annually thereafter. If quantitative fit testing is used for a negative pressure respirator, a fit factor that is at least 10 times the protection factor for that class of respirators (Table 1 in (b)(i) of this subsection) shall be achieved at testing.

(iii) For each employee wearing a tight-fitting air purifying respirator (either negative or positive pressure) who is exposed to airborne concentrations of cadmium that exceed 10 times the PEL ($10 \times 5 \mu\text{g}/\text{m}^3 = 50 \mu\text{g}/\text{m}^3$), the employer shall perform quantitative fit testing at the time of initial fitting and at least annually thereafter. For negative-pressure respirators, a fit factor that is at least ten times the protection factor for that class of respirators (Table 1 in (b)(i) of this subsection) shall be achieved during quantitative fit testing.

(iv) For each employee wearing a tight-fitting, supplied-air respirator or self-contained breathing apparatus, the employer shall perform quantitative fit testing at the time of initial fitting and at least annually thereafter. This shall be accomplished by fit testing an air purifying respirator of identical type facepiece, make, model, and size as the supplied air respirator or self-contained breathing apparatus that is

equipped with HEPA filters and tested as a surrogate (substitute) in the negative pressure mode. A fit factor that is at least 10 times the protection factor for that class of respirators (Table 1 in (b)(i) of this subsection) shall be achieved during quantitative fit testing. A supplied-air respirator or self-contained breathing apparatus with the same type facepiece, make, model, and size as the air purifying respirator with which the employee passed the quantitative fit test may then be used by that employee up to the protection factor listed in Table 1 in (b)(i) of this subsection for that class of respirators.

(v) Fit testing shall be conducted in accordance with WAC 296-62-07445. Appendix C.

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

(9) Protective work clothing and equipment

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

(i) Coveralls or similar full-body work clothing;

(ii) Gloves, head coverings, and boots or foot coverings; and

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

(b) Removal and storage.

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

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

(iii) The employer shall assure that contaminated protective clothing and equipment, when removed for laundering, cleaning, maintenance, or disposal, is placed and stored in sealed, impermeable bags or other closed, impermeable containers that are designed to prevent dispersion of cadmium dust.

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

(c) Cleaning, replacement, and disposal.

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

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

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

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

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

(10) Hygiene areas and practices.

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

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

(c) Showers and handwashing facilities.

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

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

(d) Lunchroom facilities.

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

(ii) The employer shall assure that employees do not enter lunchroom facilities with protective work clothing or equipment unless surface cadmium has been removed from the clothing and equipment by HEPA vacuuming or some other method that removes cadmium dust without dispersing it.

(11) Housekeeping.

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

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

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

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

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

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

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

(12) Medical surveillance.

(a) General.

(i) Scope.

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

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

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

(B) Previously exposed—The employer shall also institute a medical surveillance program for all employees who might previously have been exposed to cadmium by the employer prior to the effective date of this section in tasks specified under (a)(i)(A) of this subsection, unless the employer demonstrates that the employee did not in the years prior to the effective date of this section work in those tasks for the employer with exposure to cadmium for an aggregated total of more than 12 months.

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

(iii) The employer shall assure that all medical examinations and procedures required by this section are performed

by or under the supervision of a licensed physician, who has read and is familiar with the health effects WAC 296-62-07441, Appendix A, the regulatory text of this section, the protocol for sample handling and lab selection in WAC 296-62-07451, Appendix F, and the questionnaire of WAC 296-62-07447, Appendix D.

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

(v) The employer shall assure that the collecting and handling of biological samples of cadmium in urine (CdU), cadmium in blood (CdB), and beta-2 microglobulin in urine (B₂-M) taken from employees under this section is done in a manner that assures their reliability and that analysis of biological samples of cadmium in urine (CdU), cadmium in blood (CdB), and beta-2 microglobulin in urine (B₂-M) taken from employees under this section is performed in laboratories with demonstrated proficiency to perform the particular analysis. (See WAC 296-62-07451, Appendix F.)

(b) Initial examination.

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

(ii) The initial medical examination shall include:

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

(B) Biological monitoring that includes the following tests:

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

(II) Beta-2 microglobulin in urine (B₂-M), standardized to grams of creatinine (g/Cr), with pH specified, as described in WAC 296-62-07451, Appendix F; and

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

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

(c) Actions triggered by initial biological monitoring.

(i) If the results of the biological monitoring tests in the initial examination show the employee's CdU level to be at or below 3 µg/g Cr, B₂-M level to be at or below 300 µg/g Cr and CdB level to be at or below 5 µg/lwb, then:

(A) For employees who are subject to medical surveillance under (a)(i)(A) of this subsection because of current or

anticipated exposure to cadmium, the employer shall provide the minimum level of periodic medical surveillance in accordance with the requirements in (d)(i) of this subsection; and

(B) For employees who are subject to medical surveillance under (a)(i)(B) of this subsection because of prior but not current exposure, the employer shall provide biological monitoring for CdU, B₂-M, and CdB one year after the initial biological monitoring and then the employer shall comply with the requirements of (d)(vi) of this subsection.

(ii) For all employees who are subject to medical surveillance under (a)(i) of this subsection, if the results of the initial biological monitoring tests show the level of CdU to exceed 3 µg/g Cr, the level of B₂-M to be in excess of 300 µg/g Cr, or the level of CdB to be in excess of 5 µg/lwb, the employer shall:

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

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

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

(III) Review the hygiene facilities;

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

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

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

(C) Within 90 days after receipt of biological monitoring results, provide a full medical examination to the employee in accordance with the requirements of (d)(ii) of this subsection. After completing the medical examination, the examining physician shall determine in a written medical opinion whether to medically remove the employee. If the physician determines that medical removal is not necessary, then until the employee's CdU level falls to or below 3 µg/g Cr, B₂-M level falls to or below 300 µg/g Cr and CdB level falls to or below 5 µg/lwb, the employer shall:

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

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

(iii) For all employees who are subject to medical surveillance under (a)(i) of this subsection, if the results of the initial biological monitoring tests show the level of CdU to be in excess of 15 µg/g Cr, or the level of CdB to be in excess of 15 µg/lwb, or the level of B₂-M to be in excess of 1,500 µg/g Cr, the employer shall comply with the requirements of (c)(ii)(A) and (B) of this subsection. Within 90 days after receipt of biological monitoring results, the employer shall provide a full medical examination to the employee in accordance with the requirements of (d)(ii) of this subsection. After completing the medical examination, the examining physician shall determine in a written medical opinion whether to medically remove the employee. However, if the initial biological monitoring results and the biological moni-

toring results obtained during the medical examination both show that: CdU exceeds 15 µg/g Cr; or CdB exceeds 15 µg/lwb; or B₂-M exceeds 1500 µg/g Cr, and in addition CdU exceeds 3 µg/g Cr or CdB exceeds 5 µg/liter of whole blood, then the physician shall medically remove the employee from exposure to cadmium at or above the action level. If the second set of biological monitoring results obtained during the medical examination does not show that a mandatory removal trigger level has been exceeded, then the employee is not required to be removed by the mandatory provisions of this section. If the employee is not required to be removed by the mandatory provisions of this section or by the physician's determination, then until the employee's CdU level falls to or below 3 µg/g Cr, B₂-M level falls to or below 300 µg/g Cr and CdB level falls to or below 5 µg/lwb, the employer shall:

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

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

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

(iv) For all employees to whom medical surveillance is provided, beginning on January 1, 1999, and in lieu of (c)(iii) of this subsection, whenever the results of initial biological monitoring tests show the employee's CdU level to be in excess of 7 µg/g Cr, or B₂-M level to be in excess of 750 µg/g Cr, or CdB level to be in excess of 10 µg/lwb, the employer shall comply with the requirements of (c)(ii)(A) and (B) of this subsection. Within 90 days after receipt of biological monitoring results, the employer shall provide a full medical examination to the employee in accordance with the requirements of (d)(ii) of this subsection. After completing the medical examination, the examining physician shall determine in a written medical opinion whether to medically remove the employee. However, if the initial biological monitoring results and the biological monitoring results obtained during the medical examination both show that: CdU exceeds 7 µg/g Cr; or CdB exceeds 10 µg/lwb; or B₂-M exceeds 750 µg/g Cr, and in addition CdU exceeds 3 µg/g Cr or CdB exceeds 5 µg/liter of whole blood, then the physician shall medically remove the employee from exposure to cadmium at or above the action level. If the second set of biological monitoring results obtained during the medical examination does not show that a mandatory removal trigger level has been exceeded, then the employee is not required to be removed by the mandatory provisions of this section. If the employee is not required to be removed by the mandatory provisions of this section or by the physician's determination, then until the employee's CdU level falls to or below 3 µg/g Cr, B₂-M level falls to or below 300 µg/g Cr and CdB level falls to or below 5 µg/lwb, the employer shall:

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

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

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

(d) Periodic medical surveillance.

(1999 Ed.)

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

(ii) The periodic medical examination shall include:

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

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

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

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

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

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

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

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

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

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

(iv) If the results of periodic biological monitoring or the results of biological monitoring performed as part of the periodic medical examination show the level of the employee's CdU, B₂-M, or CdB to be in excess of the levels specified in (c)(ii) and (iii) of this subsection; or, beginning on January 1, 1999, in excess of the levels specified in (c)(ii) or (iv) of this subsection, the employer shall take the appropriate actions specified in (c)(ii) through (iv) of this subsection, respectively.

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

(A) If the employee's levels of CdU did not exceed 3 µg/g Cr, CdB did not exceed 5 µg/lwb, and B₂-M did not

exceed 300 µg/g Cr in the initial biological monitoring tests, and if the results of the follow-up biological monitoring required by (c)(i)(B) of this subsection one year after the initial examination confirm the previous results, the employer may discontinue all periodic medical surveillance for that employee.

(B) If the initial biological monitoring results for CdU, CdB, or B₂-M were in excess of the levels specified in (c)(i) of this subsection, but subsequent biological monitoring results required by (c)(ii) through (iv) of this subsection show that the employee's CdU levels no longer exceed 3 µg/g Cr, CdB levels no longer exceed 5 µg/lwb, and B₂-M levels no longer exceed 300 µg/g Cr, the employer shall provide biological monitoring for CdU, CdB, and B₂-M one year after these most recent biological monitoring results. If the results of the follow-up biological monitoring specified in this section, confirm the previous results, the employer may discontinue all periodic medical surveillance for that employee.

(C) However, if the results of the follow-up tests specified in (d)(v)(A) or (B) of this subsection indicate that the level of the employee's CdU, B₂-M, or CdB exceeds these same levels, the employer is required to provide annual medical examinations in accordance with the provisions of (d)(ii) of this subsection until the results of biological monitoring are consistently below these levels or the examining physician determines in a written medical opinion that further medical surveillance is not required to protect the employee's health.

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

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

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

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

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

(f) Examination for respirator use.

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

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

(B) A blood pressure test;

(C) Biological monitoring of the employee's levels of CdU, CdB and B₂-M in accordance with the requirements of (b)(ii)(B) of this subsection, unless such results already have been obtained within the twelve months; and

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

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

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

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

(g) Emergency examinations.

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

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

(h) Termination of employment examination.

(i) At termination of employment, the employer shall provide a medical examination in accordance with (d)(ii) of this subsection, including a chest x-ray where necessary, to any employee to whom at any prior time the employer was

required to provide medical surveillance under (a)(i) or (g) of this subsection. However, if the last examination satisfied the requirements of (d)(ii) of this subsection and was less than six months prior to the date of termination, no further examination is required unless otherwise specified in (c) or (e) of this subsection;

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

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

(i) A copy of this standard and appendices;

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

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

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

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

(j) Physician's written medical opinion.

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

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

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

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

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

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

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

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

(k) Medical removal protection (MRP).

(i) General.

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

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

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

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

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

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

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

(iv) Except as specified in (k)(v) of this subsection, no employee who was removed because his/her level of CdU, CdB and/or B₂-M exceeded the trigger levels in (c) or (d) of this subsection may be returned to work with exposure to cadmium at or above the action level until the employee's levels of CdU fall to or below 3 µg/g Cr, CdB fall to or below 5 µg/lwb, and B₂-M fall to or below 300 µg/g Cr.

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

employee is no longer subject to mandatory medical removal. Subsequent questions regarding the employee's medical removal shall be decided solely by a final medical determination.

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

(l) Medical removal protection benefits.

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

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

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

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

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

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

(m) Multiple physician review.

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

(A) Review any findings, determinations, or recommendations of the initial physician; and

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

(ii) The employer shall promptly notify an employee of the right to seek a second medical opinion after each occasion that an initial physician provided by the employer conducts a medical examination or consultation pursuant to this section. The employer may condition its participation in, and payment for, multiple physician review upon the employee doing the following within fifteen (15) days after receipt of this notice,

or receipt of the initial physician's written opinion, whichever is later:

(A) Informing the employer that he or she intends to seek a medical opinion; and

(B) Initiating steps to make an appointment with a second physician.

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

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

(A) Review any findings, determinations, or recommendations of the other two physicians; and

(B) Conduct such examinations, consultations, laboratory tests, and discussions with the other two physicians as the third physician deems necessary to resolve the disagreement among them.

(v) The employer shall act consistently with the findings, determinations, and recommendations of the third physician, unless the employer and the employee reach an agreement that is consistent with the recommendations of at least one of the other two physicians.

(n) Alternate physician determination. The employer and an employee or designated employee representative may agree upon the use of any alternate form of physician determination in lieu of the multiple physician review provided by (m) of this subsection, so long as the alternative is expeditious and at least as protective of the employee.

(o) Information the employer must provide the employee.

(i) The employer shall provide a copy of the physician's written medical opinion to the examined employee within five working days after receipt thereof.

(ii) The employer shall provide the employee with a copy of the employee's biological monitoring results and an explanation sheet explaining the results within five working days after receipt thereof.

(iii) Within 30 days after a request by an employee, the employer shall provide the employee with the information the employer is required to provide the examining physician under (i) of this subsection.

(p) Reporting. In addition to other medical events that are required to be reported on the OSHA Form No. 200, the employer shall report any abnormal condition or disorder caused by occupational exposure to cadmium associated with employment as specified in Chapter (V)(E) of the Bureau of Labor Statistics Recordkeeping Guidelines for Occupational Injuries and Illnesses.

(13) Communication of cadmium hazards to employees

(a) General. In communications concerning cadmium hazards, employers shall comply with the requirements of WISHA's Hazard Communication Standard, chapter 296-62 WAC, Part C, including but not limited to the requirements concerning warning signs and labels, material safety data sheets (MSDS), and employee information and training. In

addition, employers shall comply with the following requirements:

(b) Warning signs.

(i) Warning signs shall be provided and displayed in regulated areas. In addition, warning signs shall be posted at all approaches to regulated areas so that an employee may read the signs and take necessary protective steps before entering the area.

(ii) Warning signs required by (b)(i) of this subsection shall bear the following information:

Danger, Cadmium, Cancer Hazard, Can Cause Lung and
Kidney Disease, Authorized Personnel Only, Respirators
Required in This Area

(iii) The employer shall assure that signs required by this section are illuminated, cleaned, and maintained as necessary so that the legend is readily visible.

(c) Warning labels.

(i) Shipping and storage containers containing cadmium, cadmium compounds, or cadmium contaminated clothing, equipment, waste, scrap, or debris shall bear appropriate warning labels, as specified in (c)(ii) of this subsection.

(ii) The warning labels shall include at least the following information:

Danger, Contains Cadmium, Cancer Hazard, Avoid Creating
Dust, Can Cause Lung and Kidney Disease

(iii) Where feasible, installed cadmium products shall have a visible label or other indication that cadmium is present.

(d) Employee information and training.

(i) The employer shall institute a training program for all employees who are potentially exposed to cadmium, assure employee participation in the program, and maintain a record of the contents of such program.

(ii) Training shall be provided prior to or at the time of initial assignment to a job involving potential exposure to cadmium and at least annually thereafter.

(iii) The employer shall make the training program understandable to the employee and shall assure that each employee is informed of the following:

(A) The health hazards associated with cadmium exposure, with special attention to the information incorporated in WAC 296-62-07441, Appendix A;

(B) The quantity, location, manner of use, release, and storage of cadmium in the workplace and the specific nature of operations that could result in exposure to cadmium, especially exposures above the PEL;

(C) The engineering controls and work practices associated with the employee's job assignment;

(D) The measures employees can take to protect themselves from exposure to cadmium, including modification of such habits as smoking and personal hygiene, and specific procedures the employer has implemented to protect employees from exposure to cadmium such as appropriate work practices, emergency procedures, and the provision of personal protective equipment;

(E) The purpose, proper selection, fitting, proper use, and limitations of respirators and protective clothing;

(F) The purpose and a description of the medical surveillance program required by subsection (12) of this section;

(G) The contents of this section and its appendices; and

(H) The employee's rights of access to records under chapter 296-62 WAC, Part B.

(iv) Additional access to information and training program and materials.

(A) The employer shall make a copy of this section and its appendices readily available to all affected employees and shall provide a copy without cost if requested.

(B) Upon request, the employer shall provide to the director or authorized representative, all materials relating to the employee information and the training program.

(e) Multi-employer workplace. In a multi-employer workplace, an employer who produces, uses, or stores cadmium in a manner that may expose employees of other employers to cadmium shall notify those employers of the potential hazard in accordance with WAC 296-62-05409 of the hazard communication standard.

(14) Recordkeeping.

(a) Exposure monitoring.

(i) The employer shall establish and keep an accurate record of all air monitoring for cadmium in the workplace.

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

(A) The monitoring date, shift, duration, air volume, and results in terms of an 8-hour TWA of each sample taken, and if cadmium is not detected, the detection level;

(B) The name, Social Security number, and job classification of all employees monitored and of all other employees whose exposures the monitoring result is intended to represent, including, where applicable, a description of how it was determined that the employee's monitoring result could be taken to represent other employee's exposures;

(C) A description of the sampling and analytical methods used and evidence of their accuracy;

(D) The type of respiratory protective device, if any, worn by the monitored employee and by any other employee whose exposure the monitoring result is intended to represent;

(E) A notation of any other conditions that might have affected the monitoring results;

(F) Any exposure monitoring or objective data that were used and the levels.

(iii) The employer shall maintain this record for at least thirty (30) years, in accordance with WAC 296-62-05207.

(iv) The employer shall also provide a copy of the results of an employee's air monitoring prescribed in subsection (4) of this section to an industry trade association and to the employee's union, if any, or, if either of such associations or unions do not exist, to another comparable organization that is competent to maintain such records and is reasonably accessible to employers and employees in the industry.

(b) Objective data for exemption from requirement for initial monitoring.

(i) For purposes of this section, objective data are information demonstrating that a particular product or material containing cadmium or a specific process, operation, or activity involving cadmium cannot release dust or fumes in concentrations at or above the action level even under the worst-

case release conditions. Objective data can be obtained from an industry-wide study or from laboratory product test results from manufacturers of cadmium-containing products or materials. The data the employer uses from an industry-wide survey must be obtained under workplace conditions closely resembling the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

(ii) The employer shall maintain the record for at least 30 years of the objective data relied upon.

(c) Medical surveillance.

(i) The employer shall establish and maintain an accurate record for each employee covered by medical surveillance under (a)(i) of this subsection.

(ii) The record shall include at least the following information about the employee:

(A) Name, Social Security number, and description of duties;

(B) A copy of the physician's written opinions and of the explanation sheets for biological monitoring results;

(C) A copy of the medical history, and the results of any physical examination and all test results that are required to be provided by this section, including biological tests, x-rays, pulmonary function tests, etc., or that have been obtained to further evaluate any condition that might be related to cadmium exposure;

(D) The employee's medical symptoms that might be related to exposure to cadmium; and

(E) A copy of the information provided to the physician as required by subsection (12)(i) of this section.

(iii) The employer shall assure that this record is maintained for the duration of employment plus thirty (30) years, in accordance with WAC 296-62-05207.

(iv) At the employee's request, the employer shall promptly provide a copy of the employee's medical record, or update as appropriate, to a medical doctor or a union specified by the employee.

(d) Training. The employer shall certify that employees have been trained by preparing a certification record which includes the identity of the person trained, the signature of the employer or the person who conducted the training, and the date the training was completed. The certification records shall be prepared at the completion of training and shall be maintained on file for one (1) year beyond the date of training of that employee.

(e) Availability.

(i) Except as otherwise provided for in this section, access to all records required to be maintained by (a) through (d) of this subsection shall be in accordance with the provisions of WAC 296-62-052.

(ii) Within 15 days after a request, the employer shall make an employee's medical records required to be kept by (c) of this subsection available for examination and copying to the subject employee, to designated representatives, to anyone having the specific written consent of the subject employee, and after the employee's death or incapacitation, to the employee's family members.

(f) Transfer of records. Whenever an employer ceases to do business and there is no successor employer or designated organization to receive and retain records for the prescribed

period, the employer shall comply with the requirements concerning transfer of records set forth in WAC 296-62-05215.

(15) Observation of monitoring.

(a) Employee observation. The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to cadmium.

(b) Observation procedures. When observation of monitoring requires entry into an area where the use of protective clothing or equipment is required, the employer shall provide the observer with that clothing and equipment and shall assure that the observer uses such clothing and equipment and complies with all other applicable safety and health procedures.

(16) Dates.

(a) Effective date. This section shall become effective on June 14, 1993.

(b) Start-up dates. All obligations of this section commence on the effective date except as follows:

(i) Exposure monitoring. Except for small businesses (fifty or fewer employees), initial monitoring required by subsection (4)(b) of this section shall be completed as soon as possible and in any event no later than 60 days after the effective date of this section. For small businesses, initial monitoring required by subsection (4)(b) of this section shall be completed as soon as possible and in any event no later than 120 days after the effective date of this section.

(ii) The permissible exposure limit (PEL). Except for small businesses, as defined under (b)(i) of this subsection, the employer shall comply with the PEL established by subsection (3) of this section as soon as possible and in any event no later than 90 days after the effective date of this section. For small businesses, the employer shall comply with the PEL established by subsection (3) of this section as soon as possible and in any event no later than 150 days after the effective date of this section.

(iii) Regulated areas. Except for small businesses, as defined under (b)(i) of this subsection, regulated areas required to be established by subsection (5) of this section shall be set up as soon as possible after the results of exposure monitoring are known and in any event no later than 90 days after the effective date of this section. For small businesses, regulated areas required to be established by subsection (5) of this section shall be set up as soon as possible after the results of exposure monitoring are known and in any event no later than 150 days after the effective date of this section.

(iv) Respiratory protection. Except for small businesses, as defined under (b)(i) of this subsection, respiratory protection required by subsection (7) of this section shall be provided as soon as possible and in any event no later than 90 days after the effective date of this section. For small businesses, respiratory protection required by subsection (7) of this section shall be provided as soon as possible and in any event no later than 150 days after the effective date of this section.

(v) Compliance program. Except for small businesses, as defined under (b)(i) of this subsection, written compliance programs required by subsection (6)(b) of this section shall be completed and available as soon as possible and in any event no later than 90 days after the effective date of this section.

tion. For small businesses, written compliance programs required by subsection (6)(b) of this section shall be completed and available as soon as possible and in any event no later than 180 days after the effective date of this section.

(vi) **Methods of compliance.** Except for small businesses, as defined under (b)(i) of this subsection, the engineering controls required by subsection (6)(a) of this section shall be implemented as soon as possible and in any event no later than 120 days after the effective date of this section. For small businesses, the engineering controls required by subsection (6)(a) of this section shall be implemented as soon as possible and in any event no later than 240 days after the effective date of this section. Work practice controls shall be implemented as soon as possible. Work practice controls that are directly related to engineering controls to be implemented shall be implemented as soon as possible after such engineering controls are implemented.

(vii) **Hygiene and lunchroom facilities.** Except for small businesses, as defined under (b)(i) of this subsection, handwashing facilities, showers, change rooms and eating facilities required by subsection (10) of this section, whether permanent or temporary, shall be provided as soon as possible and in any event no later than 60 days after the effective date of this section. For small businesses, handwashing facilities, showers, change rooms and eating facilities required by subsection (10) of this section, whether permanent or temporary, shall be provided as soon as possible and in any event no later than 120 days after the effective date of this section.

(viii) **Employee information and training.** Except for small businesses, as defined under (b)(i) of this subsection, employee information and training required by subsection (13)(d) of this section shall be provided as soon as possible and in any event no later than 90 days after the effective date of this section. For small businesses, employee information and training required by subsection (13)(d) of this section shall be provided as soon as possible and in any event no later than 180 days after the effective date of this section.

(ix) **Medical surveillance.** Except for small businesses, as defined under (b)(i) of this subsection, initial medical examinations required by subsection (12) of this section shall be provided as soon as possible and in any event no later than 90 days after the effective date of this section. For small businesses, initial medical examinations required by subsection (12) of this section shall be provided as soon as possible and in any event no later than 180 days after the effective date of this section.

(17) **Appendices.**

(a) WAC 296-62-07445, Appendix C, is a part of this standard, and compliance with its contents is mandatory.

(b) Except where portions of WAC 296-62-07441, 296-62-07443, 296-62-07447, 296-62-07449, and 296-62-07451, Appendices A, B, D, E, and F, respectively, to this section are expressly incorporated in requirements of this section, these appendices are purely informational and are not intended to create any additional obligations not otherwise imposed or to detract from any existing obligations.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-174, filed 7/20/94, effective 9/20/94; 93-21-075 (Order 93-06), § 296-155-174, filed 10/20/93, effective 12/1/93; 93-07-044 (Order 93-01), § 296-155-174, filed 3/13/93, effective 4/27/93.]

(1999 Ed.)

WAC 296-155-176 Lead.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-176, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17603 Scope. WAC 296-155-176, Lead, applies to all construction work where an employee may be occupationally exposed to lead. All construction work excluded from coverage in the general industry standard for lead by WAC 296-62-07521 (1)(b) is covered by this standard. Construction work is defined as work for construction, alteration and/or repair, including painting and decorating. It includes but is not limited to the following:

- (1) Demolition or salvage of structures where lead or materials containing lead are present;
- (2) Removal or encapsulation of materials containing lead;
- (3) New construction, alteration, repair, or renovation of structures, substrates, or portions thereof, that contain lead, or materials containing lead;
- (4) Installation of products containing lead;
- (5) Lead contamination/emergency cleanup;
- (6) Transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed; and
- (7) Maintenance operations associated with the construction activities described in this section.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17603, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17605 Definitions. (1) **Action level** means employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air (30 $\mu\text{g}/\text{m}^3$) calculated as an 8-hour time-weighted average (TWA).

(2) **Competent person** means one who is capable of identifying existing and predictable lead hazards in the surroundings or working conditions and who has authorization to take prompt corrective measures to eliminate them.

(3) **Director** means the director of labor and industries, or his/her designated representative.

(4) **Lead** means metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.

(5) This section means WAC 296-155-176 through 296-155-17656.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17605, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17607 Permissible exposure limit. (1) The employer shall assure that no employee is exposed to lead at concentrations greater than fifty micrograms per cubic meter of air (50 $\mu\text{g}/\text{m}^3$) averaged over an 8-hour period.

(2) If an employee is exposed to lead for more than 8 hours in any work day the employees' allowable exposure, as a time weighted average (TWA) for that day, shall be reduced according to the following formula:

Allowable employee exposure (in $\mu\text{g}/\text{m}^3$) = 400 divided by hours worked in the day.

(3) When respirators are used to limit employee exposure as required by this section and all the requirements of

WAC 296-155-17611(1) and 296-155-17613 have been met, employee exposure may be considered to be at the level provided by the protection factor of the respirator for those periods the respirator is worn. Those periods may be averaged with exposure levels during periods when respirators are not worn to determine the employee's daily TWA exposure.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17607, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17609 Exposure assessment. (1) General.

(a) Each employer who has a workplace or operation covered by this standard shall initially determine if any employee may be exposed to lead at or above the action level.

(b) For the purposes of this section, employee exposure is that exposure which would occur if the employee were not using a respirator.

(c) With the exception of monitoring under subsection (3) of this section, where monitoring is required by this standard, the employer shall collect personal samples representative of a full shift including at least one sample for each job classification in each work area either for each shift or for the shift with the highest exposure level.

(d) Full shift personal samples shall be representative of the monitored employee's regular, daily exposure to lead.

(2) Protection of employees during assessment of exposure.

(a) With respect to the lead related tasks listed in this subdivision, where lead is present, until the employer performs an employee exposure assessment as required in this section and documents that the employee performing any of the listed tasks is not exposed above the PEL, the employer shall treat the employee as if the employee were exposed above the PEL, and not in excess of ten (10) times the PEL, and shall implement employee protective measures prescribed in subdivision (e) of this subsection. The tasks covered by this requirement are:

(i) Where lead containing coatings or paint are present: Manual demolition of structures (e.g, dry wall), manual scraping, manual sanding, heat gun applications, and power tool cleaning with dust collection systems;

(ii) Spray painting with lead paint.

(b) In addition, with regard to tasks not listed in subdivision (a), where the employer has any reason to believe that an employee performing the task may be exposed to lead in excess of the PEL, until the employer performs an employee exposure assessment as required by this section and documents that the employee's lead exposure is not above the PEL the employer shall treat the employee as if the employee were exposed above the PEL and shall implement employee protective measures as prescribed in subdivision (e) of this subsection.

(c) With respect to the tasks listed in this subdivision, where lead is present, until the employer performs an employee exposure assessment as required in this section, and documents that the employee performing any of the listed tasks is not exposed in excess of 500 µg/m³, the employer shall treat the employee as if the employee were exposed to lead in excess of 500 µg/m³ and shall implement employee protective measures as prescribed in subdivision

(e) of this subsection. Where the employer does establish that the employee is exposed to levels of lead below 500 µg/m³, the employer may provide the exposed employee with the appropriate respirator prescribed for such use at such lower exposures, in accordance with Table 1 of WAC 296-155-17613. The tasks covered by this requirement are:

(i) Using lead containing mortar; lead burning;

(ii) Where lead containing coatings or paint are present: Rivet busting; power tool cleaning without dust collection systems; cleanup activities where dry expendable abrasives are used; and abrasive blasting enclosure movement and removal.

(d) With respect to the tasks listed in this subdivision, where lead is present, until the employer performs an employee exposure assessment as required in this section and documents that the employee performing any of the listed tasks is not exposed to lead in excess of 2,500 µg/m³ (50xPEL), the employer shall treat the employee as if the employee were exposed to lead in excess of 2,500 µg/m³ and shall implement employee protective measures as prescribed in (e) of this subsection. Where the employer does establish that the employee is exposed to levels of lead below 2,500 µg/m³, the employer may provide the exposed employee with the appropriate respirator prescribed for use at such lower exposures, in accordance with Table I of this WAC 296-155-17613. Protection described in this section is required where lead containing coatings or paint are present on structures when performing:

(i) Abrasive blasting;

(ii) Welding;

(iii) Cutting; and

(iv) Torch burning.

(e) Until the employer performs an employee exposure assessment as required by this section and determines actual employee exposure, the employer shall provide to employees performing the tasks described in (a) through (d) of this subsection with interim protection as follows:

(i) Appropriate respiratory protection in accordance with WAC 296-155-17613.

(ii) Appropriate personal protective clothing and equipment in accordance with WAC 296-155-17615.

(iii) Change areas in accordance with WAC 296-155-17619(2).

(iv) Hand washing facilities in accordance with WAC 296-155-17619(5).

(v) Biological monitoring in accordance with WAC 296-155-17621 (1)(a), to consist of blood sampling and analysis for lead and zinc protoporphyrin levels, and

(vi) Training as required by WAC 296-155-17625 (1)(a) regarding Part C of chapter 296-62 WAC, Hazard communication; training as required by WAC 296-155-17625 (2)(c), regarding use of respirators; and training in accordance with WAC 296-155-100.

(3) Basis of initial determination.

(a) Except as provided by (c) and (d) of this subsection the employer shall monitor employee exposures and shall base initial determinations on the employee exposure monitoring results and any of the following, relevant considerations:

(i) Any information, observations, or calculations which would indicate employee exposure to lead;

(ii) Any previous measurements of airborne lead; and

(iii) Any employee complaints of symptoms which may be attributable to exposure to lead.

(b) Monitoring for the initial determination where performed may be limited to a representative sample of the exposed employees who the employer reasonably believes are exposed to the greatest airborne concentrations of lead in the workplace.

(c) Where the employer has previously monitored for lead exposures, and the data were obtained within the past 12 months during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the employer's current operations, the employer may rely on such earlier monitoring results to satisfy the requirements of subdivision (a) of this subsection and subsection (5) of this section if the sampling and analytical methods meet the accuracy and confidence levels of subsection (9) of this section.

(d) Where the employer has objective data, demonstrating that a particular product or material containing lead or a specific process, operation or activity involving lead cannot result in employee exposure to lead at or above the action level during processing, use, or handling, the employer may rely upon such data instead of implementing initial monitoring.

(i) The employer shall establish and maintain an accurate record documenting the nature and relevancy of objective data as specified in WAC 296-155-17629(4), where used in assessing employee exposure in lieu of exposure monitoring.

(ii) Objective data, as described in subdivision (d) of this subsection, is not permitted to be used for exposure assessment in connection with subsection (2) of this section.

(4) Positive initial determination and initial monitoring.

(a) Where a determination conducted under subsections (1), (2) and (3) of this section shows the possibility of any employee exposure at or above the action level the employer shall conduct monitoring which is representative of the exposure for each employee in the workplace who is exposed to lead.

(b) Where the employer has previously monitored for lead exposure, and the data were obtained within the past 12 months during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the employer's current operations, the employer may rely on such earlier monitoring results to satisfy the requirements of (a) of this subsection if the sampling and analytical methods meet the accuracy and confidence levels of subsection (9) of this section.

(5) Negative initial determination. Where a determination, conducted under subsections (1), (2), and (3) of this section is made that no employee is exposed to airborne concentrations of lead at or above the action level the employer shall make a written record of such determination. The record shall include at least the information specified in subsection (3)(a) of this section and shall also include the date of determina-

tion, location within the worksite, and the name and social security number of each employee monitored.

(6) Frequency.

(a) If the initial determination reveals employee exposure to be below the action level further exposure determination need not be repeated except as otherwise provided in subsection (7) of this section.

(b) If the initial determination or subsequent determination reveals employee exposure to be at or above the action level but at or below the PEL the employer shall perform monitoring in accordance with this section at least every 6 months. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are below the action level at which time the employer may discontinue monitoring for that employee except as otherwise provided in subsection (7) of this section.

(c) If the initial determination reveals that employee exposure is above the PEL the employer shall perform monitoring quarterly. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are at or below the PEL but at or above the action level at which time the employer shall repeat monitoring for that employee at the frequency specified in subdivision (b) of this subsection, except as otherwise provided in subsection (7) of this section. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are below the action level at which time the employer may discontinue monitoring for that employee except as otherwise provided in subsection (7) of this section.

(7) Additional exposure assessments. Whenever there has been a change of equipment, process, control, personnel or a new task has been initiated that may result in additional employees being exposed to lead at or above the action level or may result in employees already exposed at or above the action level being exposed above the PEL, the employer shall conduct additional monitoring in accordance with this section.

(8) Employee notification.

(a) Within 5 working days after completion of the exposure assessment the employer shall notify each employee in writing of the results which represent that employee's exposure.

(b) Whenever the results indicate that the representative employee exposure, without regard to respirators, is at or above the PEL the employer shall include in the written notice a statement that the employees exposure was at or above that level and a description of the corrective action taken or to be taken to reduce exposure to below that level.

(9) Accuracy of measurement. The employer shall use a method of monitoring and analysis which has an accuracy (to a confidence level of 95%) of not less than plus or minus 25 percent for airborne concentrations of lead equal to or greater than 30 $\mu\text{g}/\text{m}^3$.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17609, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17611 Methods of compliance. (1) Engineering and work practice controls. The employer shall

implement engineering and work practice controls, including administrative controls, to reduce and maintain employee exposure to lead to or below the permissible exposure limit to the extent that such controls are feasible. Wherever all feasible engineering and work practices controls that can be instituted are not sufficient to reduce employee exposure to or below the permissible exposure limit prescribed in WAC 296-155-17607, the employer shall nonetheless use them to reduce employee exposure to the lowest feasible level and shall supplement them by the use of respiratory protection that complies with the requirements of WAC 296-155-17613.

(2) Compliance program.

(a) Prior to commencement of the job each employer shall establish and implement a written compliance program to achieve compliance with WAC 296-155-17607.

(b) Written plans for these compliance programs shall include at least the following:

(i) A description of each activity in which lead is emitted; e.g., equipment used, material involved, controls in place, crew size, employee job responsibilities, operating procedures and maintenance practices;

(ii) A description of the specific means that will be employed to achieve compliance and, where engineering controls are required engineering plans and studies used to determine methods selected for controlling exposure to lead;

(iii) A report of the technology considered in meeting the PEL;

(iv) Air monitoring data which documents the source of lead emissions;

(v) A detailed schedule for implementation of the program, including documentation such as copies of purchase orders for equipment, construction contracts, etc.;

(vi) A work practice program which includes under requirements in WAC 296-155-17615, 296-155-17617, and 296-155-17619, and incorporates other relevant work practices such as those specified in subsection (5) of this section;

(vii) An administrative control schedule required by subsection (4) of this section, if applicable;

(viii) Other relevant information.

(c) The compliance program shall provide for frequent and regular inspections of job sites, materials, and equipment to be made by a competent person.

(d) Written programs shall be submitted upon request to any affected employee or authorized employee representatives, and the director, and shall be available at the worksite for examination and copying by the director.

(e) Written programs shall be revised and updated at least every 6 months to reflect the current status of the program.

(3) Mechanical ventilation. When ventilation is used to control lead exposure, the employer shall evaluate the mechanical performance of the system in controlling exposure as necessary to maintain its effectiveness.

(4) Administrative controls. If administrative controls are used as a means of reducing employees TWA exposure to lead, the employer shall establish and implement a job rotation schedule which includes:

(a) Name or identification number of each affected employee;

(b) Duration and exposure levels at each job or work station where each affected employee is located; and

(c) Any other information which may be useful in assessing the reliability of administrative controls to reduce exposure to lead.

(5) The employer shall ensure that, to the extent relevant, employees follow good work practices such as described in Appendix B, WAC 296-155-17652.

[Statutory Authority: Chapter 49.17 RCW, 93-22-054 (Order 93-07), § 296-155-17611, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17613 Respiratory protection. (1) General. Where the use of respirators is required by WAC 296-155-176 the employer shall provide, at no cost to the employee, and assure the use of respirators which comply with the requirements of this section. Respirators shall be used in the following circumstances:

(a) Whenever an employee's exposure to lead exceeds the PEL;

(b) In work situations in which engineering controls and work practices are not sufficient to reduce exposures to or below the PEL;

(c) Whenever an employee requests a respirator; and

(d) Protection for employees performing tasks as specified in WAC 296-155-17609(2).

(2) Respirator selection.

(a) Where respirators are used by WAC 296-155-176 the employer shall select the appropriate respirator or combination of respirators from Table I below.

(b) The employer shall provide a powered, air-purifying respirator in lieu of the respirator specified in Table I whenever:

(i) An employee chooses to use this type of respirator; and

(ii) This respirator will provide adequate protection to the employee.

(c) The employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11.

Table I.— Respiratory Protection for Lead Aerosols

Airborne concentration of lead or condition of use	Required respirator ^a
Not in excess of 500 µg/m ³	1/2 mask air purifying respirator with high efficiency filters, ^{b, c} 1/2 mask supplied air respirator operated in demand (negative pressure) mode.
Not in excess of 1,250 µg/m ³	Loose fitting hood or helmet powered air purifying respirator with high efficiency filters. ^c Hood or helmet supplied air respirator operated in a continuous-flow mode— e.g., type CE abrasive blasting respirators operated in a continuous-flow mode.

Airborne concentration of lead or condition of use	Required respirator ^a
Not in excess of 2,500 µg/m ³	Full facepiece air purifying respirator with high efficiency filters. ^c Tight fitting powered air purifying respirator with high efficiency filters. ^c Full facepiece supplied air respirator operated in demand mode. 1/2 mask or full facepiece supplied air respirator operated in a continuous-flow mode. Full facepiece self-contained breathing apparatus (SCBA) operated in demand mode.
Not in excess of 50,000 µg/m ³	1/2 mask supplied air respirator operated in pressure demand or other positive-pressure mode.
Not in excess of 100,000 µg/m	Full facepiece supplied air respirator operated in pressure demand or other positive-pressure mode—e.g., type CE abrasive blasting respirators operated in a positive-pressure mode.
Greater than 100,000 µg/m ³ unknown concentration, or fire fighting	Full facepiece SCBA operated in pressure demand or other positive pressure mode.

^a Respirators specified for higher concentrations can be used at lower concentrations of lead.

^b Full facepiece is required if the lead aerosols cause eye or skin irritation at the use concentrations.

^c A high efficiency particulate filter (HEPA) means a filter that is 99.97 percent efficient against particles of 0.3 micron size or larger.

(3) Respirator usage.

(a) The employer shall assure that the respirator issued to the employee exhibits minimum facepiece leakage and that the respirator is fitted properly.

(b) Employers shall perform either quantitative or qualitative face fit tests at the time of initial fitting and at least every six months thereafter for each employee wearing negative pressure respirators. The qualitative fit tests may be used only for testing the fit of half-mask respirators where they are permitted to be worn, and shall be conducted in accordance with appendix D, WAC 296-155-17656. The tests shall be used to select facepieces that provide the required protection as prescribed in Table I.

(c) If an employee exhibits difficulty in breathing during the fitting test or during use, the employer shall make available to the employee an examination in accordance with WAC 296-155-17621 (3)(a)(ii) to determine whether the employee can wear a respirator while performing the required duty.

(4) Respirator program.

(a) The employer shall institute a respiratory protection program in accordance with part E, chapter 296-62 WAC.

(b) The employer shall permit each employee who uses a filter respirator to change the filter elements whenever an increase in breathing resistance is detected and shall maintain an adequate supply of filter elements for this purpose.

(c) Employees who wear respirators shall be permitted to leave work areas to wash their face and respirator facepiece whenever necessary to prevent skin irritation associated with respirator use.

(1999 Ed.)

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17613, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17615 Protective work clothing and equipment. (1) Provision and use. Where an employee is exposed to lead above the PEL without regard to the use of respirators, where employees are exposed to lead compounds which may cause skin or eye irritation (e.g., lead arsenate, lead azide), and as protection for employees performing tasks as specified in WAC 296-155-17609(2), the employer shall provide at no cost to the employee and assure that the employee uses appropriate protective work clothing and equipment that prevents contamination of the employee and the employee's garments such as, but not limited to:

- (a) Coveralls or similar full-body work clothing;
- (b) Gloves, hats, and shoes or disposable shoe coverlets; and
- (c) Face shields, vented goggles, or other appropriate protective equipment which complies with WAC 296-24-078.

(2) Cleaning and replacement.

(a) The employer shall provide the protective clothing required in subsection (1) of this section in a clean and dry condition at least weekly, and daily to employees whose exposure levels without regard to a respirator are over 200 µg/m³ of lead as an 8-hour TWA.

(b) The employer shall provide for the cleaning, laundering, and disposal of protective clothing and equipment required by subsection (1) of this section.

(c) The employer shall repair or replace required protective clothing and equipment as needed to maintain their effectiveness.

(d) The employer shall assure that all protective clothing is removed at the completion of a work shift only in change areas provided for that purpose as prescribed in WAC 296-155-17619(2).

(e) The employer shall assure that contaminated protective clothing which is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area which prevents dispersion of lead outside the container.

(f) The employer shall inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

(g) The employer shall assure that the containers of contaminated protective clothing and equipment required by subdivision (e) of this subsection are labelled as follows:

Caution: Clothing contaminated with lead. Do not remove dust by blowing or shaking. Dispose of lead contaminated wash water in accordance with applicable local, state, or federal regulations.

(h) The employer shall prohibit the removal of lead from protective clothing or equipment by blowing, shaking, or any other means which disperses lead into the air.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17615, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17617 Housekeeping. (1) All surfaces shall be maintained as free as practicable of accumulations of lead.

(2) Clean-up of floors and other surfaces where lead accumulates shall wherever possible, be cleaned by vacuum-

ing or other methods that minimize the likelihood of lead becoming airborne.

(3) Shoveling, dry or wet sweeping, and brushing may be used only where vacuuming or other equally effective methods have been tried and found not to be effective.

(4) Where vacuuming methods are selected, the vacuums shall be equipped with HEPA filters and used and emptied in a manner which minimizes the reentry of lead into the workplace.

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

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17617, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17619 Hygiene facilities and practices.

(1) The employer shall assure that in areas where employees are exposed to lead above the PEL without regard to the use of respirators, food or beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied.

(2) Change areas.

(a) The employer shall provide clean change areas for employees whose airborne exposure to lead is above the PEL, and as protection for employees performing tasks as specified in WAC 296-155-17609(2), without regard to the use of respirators.

(b) The employer shall assure that change areas are equipped with separate storage facilities for protective work clothing and equipment and for street clothes which prevent cross-contamination.

(c) The employer shall assure that employees do not leave the workplace wearing any protective clothing or equipment that is required to be worn during the work shift.

(3) Showers.

(a) The employer shall provide shower facilities, where feasible, for use by employees whose airborne exposure to lead is above the PEL.

(b) The employer shall assure, where shower facilities are available, that employees shower at the end of the work shift and shall provide an adequate supply of cleansing agents and towels for use by affected employees.

(4) Eating facilities.

(a) The employer shall provide lunchroom facilities or eating areas for employees whose airborne exposure to lead is above the PEL, without regard to the use of respirators.

(b) The employer shall assure that lunchroom facilities or eating areas are as free as practicable from lead contamination and are readily accessible to employees.

(c) The employer shall assure that employees whose airborne exposure to lead is above the PEL, without regard to the use of a respirator, wash their hands and face prior to eating, drinking, smoking or applying cosmetics.

(d) The employer shall assure that employees do not enter lunchroom facilities or eating areas with protective work clothing or equipment unless surface lead dust has been removed by vacuuming, downdraft booth, or other cleaning method that limits dispersion of lead dust.

(5) Hand washing facilities.

(a) The employer shall provide adequate handwashing facilities for use by employees exposed to lead in accordance with WAC 296-155-140.

(b) Where showers are not provided the employer shall assure that employees wash their hands and face at the end of the work-shift.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17619, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17621 Medical surveillance. (1) General.

(a) The employer shall make available initial medical surveillance to employees occupationally exposed on any day to lead at or above the action level. Initial medical surveillance consists of biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels.

(b) The employer shall institute a medical surveillance program in accordance with subsections (2) and (3) of this section for all employees who are or may be exposed by the employer at or above the action level for more than 30 days in any consecutive 12 months;

(c) The employer shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician.

(d) The employer shall make available the required medical surveillance including multiple physician review under subsection (3)(c) without cost to employees and at a reasonable time and place.

(2) Biological monitoring.

(a) Blood lead and ZPP level sampling and analysis. The employer shall make available biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels to each employee covered by subsection (1)(a) and (b) of this section on the following schedule:

(i) For each employee covered by subsection (1)(b) of this section, at least every 2 months for the first 6 months and every 6 months thereafter;

(ii) For each employee covered by subsection (1)(a) or (b) of this section whose last blood sampling and analysis indicated a blood lead level at or above 40 µg/dl, at least every two months. This frequency shall continue until two consecutive blood samples and analyses indicate a blood lead level below 40 µg/dl; and

(iii) For each employee who is removed from exposure to lead due to an elevated blood lead level at least monthly during the removal period.

(b) Follow-up blood sampling tests. Whenever the results of a blood lead level test indicate that an employee's blood lead level exceeds the numerical criterion for medical removal under WAC 296-155-17623 (1)(a), the employer shall provide a second (follow-up) blood sampling test within two weeks after the employer receives the results of the first blood sampling test.

(c) Accuracy of blood lead level sampling and analysis. Blood lead level sampling and analysis provided pursuant to this WAC 296-155-176 shall have an accuracy (to a confidence level of 95 percent) within plus or minus 15 percent or 6 µg/dl, whichever is greater, and shall be conducted by a laboratory approved by OSHA.

(d) Employee notification.

(i) Within five working days after the receipt of biological monitoring results, the employer shall notify each employee in writing of their blood lead level; and

(ii) The employer shall notify each employee whose blood lead level exceeds 40 µg/dl that the standard requires temporary medical removal with Medical Removal Protection benefits when an employee's blood lead level exceeds the numerical criterion for medical removal under WAC 296-155-17623 (1)(a).

(3) Medical examinations and consultations.

(a) Frequency. The employer shall make available medical examinations and consultations to each employee covered by subsection (1)(b) of this section on the following schedule:

(i) At least annually for each employee for whom a blood sampling test conducted at any time during the preceding 12 months indicated a blood lead level at or above 40 µg/dl;

(ii) As soon as possible, upon notification by an employee either that the employee has developed signs or symptoms commonly associated with lead intoxication, that the employee desires medical advice concerning the effects of current or past exposure to lead on the employee's ability to procreate a healthy child, that the employee is pregnant, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during use; and

(iii) As medically appropriate for each employee either removed from exposure to lead due to a risk of sustaining material impairment to health, or otherwise limited pursuant to a final medical determination.

(b) Content. The content of medical examinations made available pursuant to subdivision (a)(ii) and (iii) of this subsection shall be determined by an examining physician and, if requested by an employee, shall include pregnancy testing or laboratory evaluation of male fertility. Medical examinations made available pursuant to subdivision (a)(i) of this subsection shall include the following elements:

(i) A detailed work history and a medical history, with particular attention to past lead exposure (occupational and non-occupational), personal habits (smoking, hygiene), and past gastrointestinal, hematologic, renal, cardiovascular, reproductive and neurological problems;

(ii) A thorough physical examination, with particular attention to teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, and neurological systems. Pulmonary status should be evaluated if respiratory protection will be used;

(iii) A blood pressure measurement;

(iv) A blood sample and analysis which determines:

(A) Blood lead level;

(B) Hemoglobin and hematocrit determinations, red cell indices, and examination of peripheral smear morphology;

(C) Zinc protoporphyrin;

(D) Blood urea nitrogen; and,

(E) Serum creatinine;

(v) A routine urinalysis with microscopic examination; and

(vi) Any laboratory or other test relevant to lead exposure which the examining physician deems necessary by sound medical practice.

(c) Multiple physician review mechanism.

(i) If the employer selects the initial physician who conducts any medical examination or consultation provided to an employee by WAC 296-155-176, the employee may designate a second physician:

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

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

(ii) The employer shall promptly notify an employee of the right to seek a second medical opinion after each occasion that an initial physician conducts a medical examination or consultation pursuant to WAC 296-155-176. The employer may condition its participation in, and payment for, the multiple physician review mechanism upon the employee doing the following within fifteen days after receipt of the foregoing notification, or receipt of the initial physician's written opinion, whichever is later:

(A) The employee informing the employer that they intend to seek a second medical opinion; and

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

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

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

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

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

(v) The employer shall act consistent with the findings, determinations and recommendations of the third physician, unless the employer and the employee reach an agreement which is otherwise consistent with the recommendations of at least one of the three physicians.

(d) Information provided to examining and consulting physicians.

(i) The employer shall provide an initial physician conducting a medical examination or consultation under WAC 296-155-176 with the following information:

(A) A copy of this regulation for lead including all Appendices;

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

(C) The employee's exposure level or anticipated exposure level to lead and to any other toxic substance (if applicable);

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

(E) Prior blood lead determinations; and

(F) All prior written medical opinions concerning the employee in the employer's possession or control.

(ii) The employer shall provide the foregoing information to a second or third physician conducting a medical examination or consultation under WAC 296-155-176 upon request either by the second or third physician, or by the employee.

(e) Written medical opinions.

(i) The employer shall obtain and furnish the employee with a copy of a written medical opinion from each examining or consulting physician which contains only the following information:

(A) The physician's opinion as to whether the employee has any detected medical condition which would place the employee at increased risk of material impairment of the employee's health from exposure to lead;

(B) Any recommended special protective measures to be provided to the employee, or limitations to be placed upon the employee's exposure to lead;

(C) Any recommended limitation upon the employee's use of respirators, including a determination of whether the employee can wear a powered air purifying respirator if a physician determines that the employee cannot wear a negative pressure respirator; and

(D) The results of the blood lead determinations.

(ii) The employer shall instruct each examining and consulting physician to:

(A) Not reveal either in the written opinion or orally, or in any other means of communication with the employer, findings, including laboratory results, or diagnoses unrelated to an employee's occupational exposure to lead; and

(B) Advise the employee of any medical condition, occupational or nonoccupational, which dictates further medical examination or treatment.

(f) Alternate physician determination mechanisms. The employer and an employee or authorized employee representative may agree upon the use of any alternate physician determination mechanism in lieu of the multiple physician review mechanism provided by subdivision (c) of this subsection so long as the alternate mechanism is as expeditious and protective as the requirements contained in this section.

(4) Chelation.

(a) The employer shall assure that any person whom he retains, employs, supervises or controls does not engage in prophylactic chelation of any employee at any time.

(b) If therapeutic or diagnostic chelation is to be performed by any person in subdivision (a) of this subsection, the employer shall assure that it be done under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring and that the employee is notified in writing prior to its occurrence.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17621, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17623 Medical removal protection. (1) Temporary medical removal and return of an employee.

(a) Temporary removal due to elevated blood lead level. The employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to WAC 296-155-176 indicate that the employee's blood lead level is at or above 50 µg/dl; and

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

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

(ii) For the purposes of WAC 296-155-176, the phrase "final medical determination" means the written medical opinion on the employees' health status by the examining physician or, where relevant, the outcome of the multiple physician review mechanism or alternate medical determination mechanism used pursuant to the medical surveillance provisions of WAC 296-155-176.

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

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

(i) The employer shall return an employee to their former job status:

(A) For an employee removed due to a blood lead level at or above 50 µg/dl when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 40 µg/dl;

(B) For an employee removed due to a final medical determination, when a subsequent final medical determination results in a medical finding, determination, or opinion that the employee no longer has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.

(ii) For the purposes of WAC 296-155-176, the requirement that an employer return an employee to their former job status is not intended to expand upon or restrict any rights an employee has or would have had, absent temporary medical removal, to a specific job classification or position under the terms of a collective bargaining agreement.

(d) Removal of other employee special protective measures or limitations. The employer shall remove any limitations placed on an employee or end any special protective measures provided to an employee pursuant to a final medical determination when a subsequent final medical determination indicates that the limitations or special protective measures are no longer necessary.

(e) Employer options pending a final medical determination. Where the multiple physician review mechanism, or alternate medical determination mechanism used pursuant to the medical surveillance provisions of WAC 296-155-176, has not yet resulted in a final medical determination with respect to an employee, the employer shall act as follows:

(i) Removal. The employer may remove the employee from exposure to lead, provide special protective measures to the employee, or place limitations upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status.

(ii) Return. The employer may return the employee to their former job status, end any special protective measures provided to the employee, and remove any limitations placed upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status, with two exceptions.

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

(B) If the employee has been on removal status for the preceding eighteen months due to an elevated blood lead level, then the employer shall await a final medical determination.

(2) Medical removal protection benefits.

(a) Provision of medical removal protection benefits. The employer shall provide an employee up to eighteen (18) months of medical removal protection benefits on each occasion that an employee is removed from exposure to lead or otherwise limited pursuant to WAC 296-155-176.

(b) Definition of medical removal protection benefits. For the purposes of WAC 296-155-176, the requirement that an employer provide medical removal protection benefits means that, as long as the job the employee was removed from continues, the employer shall maintain the total normal earnings, seniority and other employment rights and benefits of an employee, including the employee's right to their former job status as though the employee had not been medically removed from the employee's job or otherwise medically limited.

(c) Follow-up medical surveillance during the period of employee removal or limitation. During the period of time that an employee is medically removed from their job or otherwise medically limited, the employer may condition the provision of medical removal protection benefits upon the employee's participation in follow-up medical surveillance made available pursuant to WAC 296-155-176.

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

(e) Other credits. The employer's obligation to provide medical removal protection benefits to a removed employee shall be reduced to the extent that the employee receives compensation for earnings lost during the period of removal either from a publicly or employer-funded compensation program, or receives income from employment with another employer made possible by virtue of the employee's removal.

(f) Voluntary removal or restriction of an employee. Where an employer, although not required by WAC 296-155-176 to do so, removes an employee from exposure to lead or otherwise places limitations on an employee due to the effects of lead exposure on the employee's medical condition,

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the employer shall provide medical removal protection benefits to the employee equal to that required by subdivisions (a) and (b) of this subsection.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17623, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17625 Employee information and training. (1) General.

(a) The employer shall communicate information concerning lead hazards according to the requirements of WISHA's Hazard Communication Standard for the construction industry, part C of chapter 296-62 WAC, including but not limited to the requirements concerning warning signs and labels, material safety data sheets (MSDS), and employee information and training. In addition, employers shall comply with the following requirements:

(b) For all employees who are subject to exposure to lead at or above the action level on any day or who are subject to exposure to lead compounds which may cause skin or eye irritation (e.g., lead arsenate, lead azide), the employer shall provide a training program in accordance with subsection (2) of this section and assure employee participation.

(c) The employer shall provide the training program as initial training prior to the time of job assignment or prior to the start up date for this requirement, whichever comes last.

(d) The employer shall also provide the training program at least annually for each employee who is subject to lead exposure at or above the action level on any day.

(2) Training program. The employer shall assure that each employee is trained in the following:

(a) The content of this standard and its appendices;

(b) The specific nature of the operations which could result in exposure to lead above the action level;

(c) The purpose, proper selection, fitting, use, and limitations of respirators;

(d) The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant);

(e) The engineering controls and work practices associated with the employee's job assignment including training of employees to follow relevant good work practices described in Appendix B, WAC 296-155-17652;

(f) The contents of any compliance plan in effect;

(g) Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician; and

(h) The employee's right of access to records under Part B, chapter 296-62 WAC.

(3) Access to information and training materials.

(a) The employer shall make readily available to all affected employees a copy of this standard and its appendices.

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

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to affected employees and their designated representatives, and the director.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17625, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17627 Signs. (1) General.

(a) The employer may use signs required by other statutes, regulations or ordinances in addition to, or in combination with, signs required by this section.

(b) The employer shall assure that no statement appears on or near any sign required by this section which contradicts or detracts from the meaning of the required sign.

(2) Signs.

(a) The employer shall post the following warning signs in each work area where an employees exposure to lead is above the PEL.

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

(b) The employer shall assure that signs required by this section are illuminated and cleaned as necessary so that the legend is readily visible.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17627, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17629 Recordkeeping. (1) Exposure assessment.

(a) The employer shall establish and maintain an accurate record of all monitoring and other data used in conducting employee exposure assessments as required in WAC 296-155-17609.

(b) Exposure monitoring records shall include:

(i) The date(s), number, duration, location and results of each of the samples taken if any, including a description of the sampling procedure used to determine representative employee exposure where applicable;

(ii) A description of the sampling and analytical methods used and evidence of their accuracy;

(iii) The type of respiratory protective devices worn, if any;

(iv) Name, social security number, and job classification of the employee monitored and of all other employees whose exposure the measurement is intended to represent; and

(v) The environmental variables that could affect the measurement of employee exposure.

(c) The employer shall maintain monitoring and other exposure assessment records in accordance with the provisions of part B, chapter 296-62 WAC.

(2) Medical surveillance.

(a) The employer shall establish and maintain an accurate record for each employee subject to medical surveillance as required by WAC 296-155-17621.

(b) This record shall include:

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

(ii) A copy of the physician's written opinions;

(iii) Results of any airborne exposure monitoring done on or for that employee and provided to the physician; and

(iv) Any employee medical complaints related to exposure to lead.

(c) The employer shall keep, or assure that the examining physician keeps, the following medical records:

(i) A copy of the medical examination results including medical and work history required by WAC 296-155-17621;

(ii) A description of the laboratory procedures and a copy of any standards or guidelines used to interpret the test results or references to that information;

(iii) A copy of the results of biological monitoring.

(d) The employer shall maintain or assure that the physician maintains medical records in accordance with the provisions of part B, chapter 296-62 WAC.

(3) Medical removals.

(a) The employer shall establish and maintain an accurate record for each employee removed from current exposure to lead pursuant to WAC 296-155-17623.

(b) Each record shall include:

(i) The name and social security number of the employee;

(ii) The date of each occasion that the employee was removed from current exposure to lead as well as the corresponding date on which the employee was returned to their former job status;

(iii) A brief explanation of how each removal was or is being accomplished; and

(iv) A statement with respect to each removal indicating whether or not the reason for the removal was an elevated blood lead level.

(c) The employer shall maintain each medical removal record for at least the duration of an employee's employment.

(4) Objective data for exemption from requirement for initial monitoring.

(a) For purposes of WAC 296-155-176, objective data are information demonstrating that a particular product or material containing lead or a specific process, operation, or activity involving lead cannot release dust or fumes in concentrations at or above the action level under any expected conditions of use. Objective data can be obtained from an industry-wide study or from laboratory product test results from manufacturers of lead containing products or materials. The data the employer uses from an industry-wide survey must be obtained under workplace conditions closely resembling the processes, types of material, control methods, work practices and environmental conditions in the employer's current operations.

(b) The employer shall maintain the record of the objective data relied upon for at least 30 years.

(5) Availability. The employer shall make available upon request all records required to be maintained by this section to affected employees, former employees, and their designated representatives, and to the director for examination and copying.

(6) Transfer of records.

(a) Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by this section.

(b) Whenever the employer ceases to do business and there is no successor employer to receive and retain the records required to be maintained by WAC 296-155-176 for

the prescribed period, these records shall be transmitted to the director.

(c) At the expiration of the retention period for the records required to be maintained by WAC 296-155-176, the employer shall notify the director at least 3 months prior to the disposal of such records and shall transmit those records to the director if requested within the period.

(d) The employer shall also comply with any additional requirements involving transfer of records set forth in WAC 296-62-05215.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17629, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17631 Observation of monitoring. (1) Employee observation. The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to lead conducted pursuant to WAC 296-155-17609.

(2) Observation procedures.

(a) Whenever observation of the monitoring of employee exposure to lead requires entry into an area where the use of respirators, protective clothing or equipment is required, the employer shall provide the observer with and assure the use of such respirators, clothing and equipment, and shall require the observer to comply with all other applicable safety and health procedures.

(b) Without interfering with the monitoring, observers shall be entitled to:

- (i) Receive an explanation of the measurement procedures;
- (ii) Observe all steps related to the monitoring of lead performed at the place of exposure; and
- (iii) Record the results obtained or receive copies of the results when returned by the laboratory.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17631, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17635 Startup dates. (1) The requirements of WAC 296-155-17607 through 296-155-17631, including administrative controls and feasible work practice controls, but not including engineering controls specified in WAC 296-155-17611(1), shall be complied with as soon as possible, but no later than 60 days from the effective date of WAC 296-155-176.

(2) Feasible engineering controls specified by WAC 296-155-17611(1) shall be implemented as soon as possible, but no later than 120 days from the effective date of WAC 296-155-176.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17635, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17650 Appendix A to WAC 296-155-176—Substance data sheet for occupational exposure to lead. The information contained in the appendices to WAC 296-155-176 is not intended by itself, to create any additional obligations not otherwise imposed by this standard nor detract from any existing obligation.

(1) Substance identification.

(a) Substance: Pure lead (Pb) is a heavy metal at room temperature and pressure and is a basic chemical element. It

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can combine with various other substances to form numerous lead compounds.

(b) Compounds covered by the standard: The word "lead" when used in this standard means elemental lead, all inorganic lead compounds and a class of organic lead compounds called lead soaps. This standard does not apply to other organic lead compounds.

(c) Uses: Exposure to lead occurs in several different occupations in the construction industry, including demolition or salvage of structures where lead or lead-containing materials are present; removal or encapsulation of lead-containing materials, new construction, alteration, repair, or renovation of structures that contain lead or materials containing lead; installation of products containing lead. In addition, there are construction related activities where exposure to lead may occur, including transportation, disposal, storage, or containment of lead or materials containing lead on construction sites, and maintenance operations associated with construction activities.

(d) Permissible exposure: The permissible exposure limit (PEL) set by the standard is 50 micrograms of lead per cubic meter of air (50 µg/m³), averaged over an 8-hour workday.

(e) Action level: The standard establishes an action level of 30 micrograms of lead per cubic meter of air (30 µg/m³), averaged over an 8-hour workday. The action level triggers several ancillary provisions of the standard such as exposure monitoring, medical surveillance, and training.

(2) Health hazard data.

(a) Ways in which lead enters your body. When absorbed into your body in certain doses, lead is a toxic substance. The object of the lead standard is to prevent absorption of harmful quantities of lead. The standard is intended to protect you not only from the immediate toxic effects of lead, but also from the serious toxic effects that may not become apparent until years of exposure have passed. Lead can be absorbed into your body by inhalation (breathing) and ingestion (eating). Lead (except for certain organic lead compounds not covered by the standard, such as tetraethyl lead) is not absorbed through your skin. When lead is scattered in the air as a dust, fume respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed. If you handle food, cigarettes, chewing tobacco, or make-up which have lead on them or handle them with hands contaminated with lead, this will contribute to ingestion. A significant portion of the lead that you inhale or ingest gets into your blood stream. Once in your blood stream, lead is circulated throughout your body and stored in various organs and body tissues. Some of this lead is quickly filtered out of your body and excreted, but some remains in the blood and other tissues. As exposure to lead continues, the amount stored in your body will increase if you are absorbing more lead than your body is excreting. Even though you may not be aware of any immediate symptoms of disease, this lead stored in your tissues can be slowly causing irreversible damage, first to individual cells, then to your organs and whole body systems.

(b) Effects of overexposure to lead.

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(i) Short term (acute) overexposure. Lead is a potent, systemic poison that serves no known useful function once absorbed by your body. Taken in large enough doses, lead can kill you in a matter of days. A condition affecting the brain called acute encephalopathy may arise which develops quickly to seizures, coma, and death from cardiorespiratory arrest. A short term dose of lead can lead to acute encephalopathy. Short term occupational exposures of this magnitude are highly unusual, but not impossible. Similar forms of encephalopathy may, however, arise from extended, chronic exposure to lower doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead, and chronic effects which take longer to acquire. Lead adversely affects numerous body systems, and causes forms of health impairment and disease which arise after periods of exposure as short as days or as long as several years.

(ii) Long-term (chronic) overexposure. Chronic overexposure to lead may result in severe damage to your blood-forming, nervous, urinary and reproductive systems. Some common symptoms of chronic overexposure include loss of appetite, metallic taste in the mouth, anxiety, constipation, nausea, pallor, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, hyperactivity and colic. In lead colic there may be severe abdominal pain. Damage to the central nervous system in general and the brain (encephalopathy) in particular is one of the most severe forms of lead poisoning. The most severe, often fatal, form of encephalopathy may be preceded by vomiting, a feeling of dullness progressing to drowsiness and stupor, poor memory, restlessness, irritability, tremor, and convulsions. It may arise suddenly with the onset of seizures, followed by coma, and death. There is a tendency for muscular weakness to develop at the same time. This weakness may progress to paralysis often observed as a characteristic "wrist drop" or "foot drop" and is a manifestation of a disease to the nervous system called peripheral neuropathy. Chronic overexposure to lead also results in kidney disease with few, if any, symptoms appearing until extensive and most likely permanent kidney damage has occurred. Routine laboratory tests reveal the presence of this kidney disease only after about two-thirds of kidney function is lost. When overt symptoms of urinary dysfunction arise, it is often too late to correct or prevent worsening conditions, and progression to kidney dialysis or death is possible. Chronic overexposure to lead impairs the reproductive systems of both men and women. Overexposure to lead may result in decreased sex drive, impotence and sterility in men. Lead can alter the structure of sperm cells raising the risk of birth defects. There is evidence of miscarriage and stillbirth in women whose husbands were exposed to lead or who were exposed to lead themselves. Lead exposure also may result in decreased fertility, and abnormal menstrual cycles in women. The course of pregnancy may be adversely affected by exposure to lead since lead crosses the placental barrier and poses risks to developing fetuses. Children born of parents either one of whom were exposed to excess lead levels are more likely to have birth defects, mental retardation, behavioral disorders or die during the first year of childhood. Overexposure to lead also disrupts the blood-forming system resulting in decreased hemoglobin (the substance in

the blood that carries oxygen to the cells) and ultimately anemia. Anemia is characterized by weakness, pallor and fatigability as a result of decreased oxygen carrying capacity in the blood.

(iii) Health protection goals of the standard. Prevention of adverse health effects for most workers from exposure to lead throughout a working lifetime requires that a worker's blood lead level (BLL, also expressed as PbB) be maintained at or below forty micrograms per deciliter of whole blood (40 $\mu\text{g}/\text{dl}$). The blood lead levels of workers (both male and female workers) who intend to have children should be maintained below 30 $\mu\text{g}/\text{dl}$ to minimize adverse reproductive health effects to the parents and to the developing fetus. The measurement of your blood lead level (BLL) is the most useful indicator of the amount of lead being absorbed by your body. Blood lead levels are most often reported in units of milligrams (mg) or micrograms (μg) of lead (1 mg=1000 μg) per 100 grams (100g), 100 milliliters (100 ml) or deciliter (dl) of blood. These three units are essentially the same. Sometime BLLs are expressed in the form of mg% or $\mu\text{g}\%$. This is a shorthand notation for 100g, 100 ml, or dl. (References to BLL measurements in this standard are expressed in the form of $\mu\text{g}/\text{dl}$.)

BLL measurements show the amount of lead circulating in your blood stream, but do not give any information about the amount of lead stored in your various tissues. BLL measurements merely show current absorption of lead, not the effect that lead is having on your body or the effects that past lead exposure may have already caused. Past research into lead-related diseases, however, has focused heavily on associations between BLLs and various diseases. As a result, your BLL is an important indicator of the likelihood that you will gradually acquire a lead-related health impairment or disease.

Once your blood lead level climbs above 40 $\mu\text{g}/\text{dl}$, your risk of disease increases. There is a wide variability of individual response to lead, thus it is difficult to say that a particular BLL in a given person will cause a particular effect. Studies have associated fatal encephalopathy with BLLs as low as 150 $\mu\text{g}/\text{dl}$. Other studies have shown other forms of diseases in some workers with BLLs well below 80 $\mu\text{g}/\text{dl}$. Your BLL is a crucial indicator of the risks to your health, but one other factor is also extremely important. This factor is the length of time you have had elevated BLLs. The longer you have an elevated BLL, the greater the risk that large quantities of lead are being gradually stored in your organs and tissues (body burden). The greater your overall body burden, the greater the chances of substantial permanent damage. The best way to prevent all forms of lead-related impairments and diseases—both short term and long term—is to maintain your BLL below 40 $\mu\text{g}/\text{dl}$. The provisions of the standard are designed with this end in mind.

Your employer has prime responsibility to assure that the provisions of the standard are complied with both by the company and by individual workers. You, as a worker, however, also have a responsibility to assist your employer in complying with the standard. You can play a key role in protecting your own health by learning about the lead hazards and their control, learning what the standard requires, following the standard where it governs your own actions, and see-

ing that your employer complies with provisions governing employee actions.

(iv) Reporting signs and symptoms of health problems. You should immediately notify your employer if you develop signs or symptoms associated with lead poisoning or if you desire medical advice concerning the effects of current or past exposure to lead or your ability to have a healthy child. You should also notify your employer if you have difficulty breathing during a respirator fit test or while wearing a respirator. In each of these cases, your employer must make available to you appropriate medical examinations or consultations. These must be provided at no cost to you and at a reasonable time and place. The standard contains a procedure whereby you can obtain a second opinion by a physician of your choice if your employer selected the initial physician.

[Statutory Authority: Chapter 49.17 RCW, 93-22-054 (Order 93-07), § 296-155-17650, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17652 Appendix B to WAC 296-155-176—Employee standard summary. This appendix summarizes key provisions of the standard for lead in construction that you as a worker should become familiar with.

(1) Permissible exposure limit (PEL)—WAC 296-62-17607.

The standard sets a permissible exposure limit (PEL) of 50 micrograms of lead per cubic meter of air ($50 \mu\text{g}/\text{m}^3$), averaged over an 8-hour workday which is referred to as a time-weighted average (TWA). This is the highest level of lead in air to which you may be permissibly exposed over an 8-hour workday. However, since this is an 8-hour average, short exposures above the PEL are permitted so long as for each 8-hour work day your average exposure does not exceed this level. This standard, however, takes into account the fact that your daily exposure to lead can extend beyond a typical 8-hour workday as the result of overtime or other alterations in your work schedule. To deal with this situation, the standard contains a formula which reduces your permissible exposure when you are exposed more than 8 hours. For example, if you are exposed to lead for 10 hours a day, the maximum permitted average exposure would be $40 \mu\text{g}/\text{m}^3$.

(2) Exposure assessment—WAC 296-155-17609.

If lead is present in your workplace in any quantity, your employer is required to make an initial determination of whether any employee's exposure to lead exceeds the action level ($30 \mu\text{g}/\text{m}^3$ averaged over an 8-hour day). Employee exposure is that exposure which would occur if the employee were not using a respirator. This initial determination requires your employer to monitor workers' exposures unless the employee has objective data which can demonstrate conclusively that no employee will be exposed to lead in excess of the action level. Where objective data is used in lieu of actual monitoring the employer must establish and maintain an accurate record, documenting its relevancy in assessing exposure levels for current job conditions. If such objective data is available, the employer need proceed no further on employee exposure assessment until such time that conditions have changed and the determination is no longer valid.

Objective data may be compiled from various sources, e.g., insurance companies and trade associations and information from suppliers or exposure data collected from simi-

lar operations. Objective data may also comprise previously-collected sampling data including area monitoring. If it cannot be determined through using objective data that worker exposure is less than the action level, your employer must conduct monitoring or must rely on relevant previous personal sampling, if available. Where monitoring is required for the initial determination, it may be limited to a representative number of employees who are reasonably expected to have the highest exposure levels. If your employer has conducted appropriate air sampling for lead in the past 12 months, they may use these results, provided they are applicable to the same employee tasks and exposure conditions and meet the requirements for accuracy as specified in the standard. As with objective data, if such results are relied upon for the initial determination, your employer must establish and maintain a record as to the relevancy of such data to current job conditions.

If there have been any employee complaints of symptoms which may be attributable to exposure to lead or if there is any other information or observations which would indicate employee exposure to lead, this must also be considered as part of the initial determination. If this initial determination shows that a reasonable possibility exists that any employee may be exposed, without regard to respirator, over the action level, your employer must set up an air monitoring program to determine the exposure level representative of each employee exposed to lead at your workplace. In carrying out this air monitoring program, your employer is not required to monitor the exposure of every employee, but they must monitor a representative number of employees and job types. Enough sampling must be done to enable each employee's exposure level to be reasonably represent full shift exposure. In addition, these air samples must be taken under conditions which represent each employee's regular, daily exposure to lead. Sampling performed in the past 12 months may be used to determine exposures above the action level if such sampling was conducted during work activities essentially similar to present work conditions.

The standard lists certain tasks which may likely result in exposures to lead in excess of the PEL and, in some cases, exposures in excess of 50 times the PEL. If you are performing any of these tasks, your employer must provide you with appropriate respiratory protection, protective clothing and equipment, change areas, hand washing facilities, biological monitoring, and training until such time that an exposure assessment is conducted which demonstrates that your exposure level is below the PEL.

If you are exposed to lead and air sampling is performed, your employer is required to notify you in writing within 5 working days of the air monitoring results which represent your exposure. If the results indicate that your exposure exceeds the PEL (without regard to your use of a respirator), then your employer must also notify you of this in writing, and provide you with a description of the corrective action that has been taken or will be taken to reduce your exposure.

Your exposure must be rechecked by monitoring, at least every six months if your exposure is at or over the action level but below the PEL. Your employer may discontinue monitoring for you if 2 consecutive measurements, taken at least 7 days apart, are at or below the action level. Air moni-

toring must be repeated every 3 months if you are exposed over the PEL. Your employer must continue monitoring for you at this frequency until 2 consecutive measurements, taken at least 7 days apart, are below the PEL but above the action level, at which time your employer must repeat monitoring of your exposure every six months and may discontinue monitoring only after your exposure drops to or below the action level. However, whenever there is a change of equipment, process, control, or personnel or a new type of job is added at your workplace which may result in new or additional exposure to lead, your employer must perform additional monitoring.

(3) Methods of compliance—WAC 296-155-17611.

Your employer is required to assure that no employee is exposed to lead in excess of the PEL as an 8-hour TWA. The standard for lead in construction requires employers to institute engineering and work practice controls including administrative controls to the extent feasible to reduce employee exposure to lead. Where such controls are feasible but not adequate to reduce exposures below the PEL they must be used nonetheless to reduce exposures to the lowest level that can be accomplished by these means and then supplemented with appropriate respiratory protection.

Your employer is required to develop and implement a written compliance program prior to the commencement of any job where employee exposures may reach the PEL as an 8-hour TWA. The standard identifies the various elements that must be included in the plan. For example, employers are required to include a description of operations in which lead is emitted, detailing other relevant information about the operation such as the type of equipment used, the type of material involved, employee job responsibilities, operating procedures and maintenance practices. In addition, your employer's compliance plan must specify the means that will be used to achieve compliance and, where engineering controls are required, include any engineering plans or studies that have been used to select the control methods. If administrative controls involving job rotation are used to reduce employee exposure to lead, the job rotation schedule must be included in the compliance plan. The plan must also detail the type of protective clothing and equipment, including respirator, housekeeping and hygiene practices that will be used to protect you from the adverse effects of exposure to lead.

The written compliance program must be made available, upon request, to affected employees and their designated representatives, and the director.

Finally, the plan must be reviewed and updated at least every 6 months to assure it reflects the current status in exposure control.

(4) Respiratory protection—WAC 296-155-17613.

Your employer is required to provide and assure your use of respirator when your exposure to lead is not controlled below the PEL by other means. The employer must pay the cost of the respirator. Whenever you request one, your employer is also required to provide you a respirator even if your air exposure level is not above the PEL. You might desire a respirator when, for example, you have received medical advice that your lead absorption should be decreased. Or, you may intend to have children in the near future, and want to reduce the level of lead in your body to

minimize adverse reproductive effects. While respirator are the least satisfactory means of controlling your exposure, they are capable of providing significant protection if properly chosen, fitted, worn, cleaned, maintained, and replaced when they stop providing adequate protection.

Your employer is required to select respirator from the types listed in Table I of the Respiratory Protection section of the standard. Any respirator chosen must be approved by the Mine Safety and Health Administration (MSHA) or the National Institute for Occupational Safety and Health (NIOSH). This respirator selection table will enable your employer to choose a type of respirator which will give you a proper amount of protection based on your airborne lead exposure. Your employer may select a type of respirator that provides greater protection than that required by the standard; that is, one recommended for a higher concentration of lead than is present in your workplace. For example, a powered air purifying respirator (PAPR) is much more protective than a typical negative pressure respirator, and may also be more comfortable to wear. A PAPR has a filter, cartridge or canister to clean the air, and a power source which continuously blows filtered air into your breathing zone. Your employer might make a PAPR available to you to ease the burden of having to wear a respirator for long periods of time. The standard provides that you can obtain a PAPR upon request.

Your employer must also start a Respiratory Protection Program. This program must include written procedures for the proper selection, use, cleaning, storage, and maintenance of respirator.

Your employer must assure that your respirator facepiece fits properly. Proper fit of a respirator facepiece is critical. Obtaining a proper fit on each employee may require your employer to make available two or three different mask types. In order to assure that your respirator fits properly and that facepiece leakage is minimized, your employer must give you either a qualitative fit test or a quantitative fit test (if you use a negative pressure respirator) in accordance with appendix D. Any respirator which has a filter, cartridge or canister which cleans the work room air before you breathe it and which requires the force of your inhalation to draw air through the filtering element is a negative pressure respirator. A positive pressure respirator supplies air to you directly. A quantitative fit test uses a sophisticated machine to measure the amount, if any, of test material that leaks into the facepiece of your respirator.

You must also receive from your employer proper training in the use of respirator. Your employer is required to teach you how to wear a respirator, to know why it is needed, and to understand its limitations.

Your employer must test the effectiveness of your negative pressure respirator initially and at least every six months thereafter with a "qualitative fit test." In this test, the fit of the facepiece is checked by seeing if you can smell a substance placed outside the respirator. If you can, there is appreciable leakage where the facepiece meets your face.

The standard provides that if your respirator uses filter elements, you must be given an opportunity to change the filter elements whenever an increase in breathing resistance is detected. You also must be permitted to periodically leave your work area to wash your face and respirator facepiece

whenever necessary to prevent skin irritation. If you ever have difficulty in breathing during a fit test or while using a respirator, your employer must make a medical examination available to you to determine whether you can safely wear a respirator. The result of this examination may be to give you a positive pressure respirator (which reduces breathing resistance) or to provide alternative means of protection.

(5) Protective work clothing and equipment—WAC 296-155-17615.

If you are exposed to lead above the PEL as an 8-hour TWA, without regard to your use of a respirator, or if you are exposed to lead compounds such as lead arsenate or lead azide which can cause skin and eye irritation, your employer must provide you with protective work clothing and equipment appropriate for the hazard. If work clothing is provided, it must be provided in a clean and dry condition at least weekly, and daily if your airborne exposure to lead is greater than 200 $\mu\text{g}/\text{m}^3$. Appropriate protective work clothing and equipment can include coveralls or similar full-body work clothing, gloves, hats, shoes or disposable shoe coverlets, and face shields or vented goggles. Your employer is required to provide all such equipment at no cost to you. In addition, your employer is responsible for providing repairs and replacement as necessary, and also is responsible for the cleaning, laundering or disposal of protective clothing and equipment.

The standard requires that your employer assure that you follow good work practices when you are working in areas where your exposure to lead may exceed the PEL. With respect to protective clothing and equipment, where appropriate, the following procedures should be observed prior to beginning work:

- ◆ Change into work clothing and shoe covers in the clean section of the designated changing areas;
- ◆ Use work garments of appropriate protective gear, including respirator before entering the work area; and
- ◆ Store any clothing not worn under protective clothing in the designated changing area.

Workers should follow these procedures upon leaving the work area:

- ◆ HEPA vacuum heavily contaminated protective work clothing while it is still being worn. At no time may lead be removed from protective clothing by any means which result in uncontrolled dispersal of lead into the air;
- ◆ Remove shoe covers and leave them in the work area;
- ◆ Remove protective clothing and gear in the dirty area of the designated changing area. Remove protective coveralls by carefully rolling down the garment to reduce exposure to dust.
- ◆ Remove respirator last; and
- ◆ Wash hands and face.

Workers should follow these procedures upon finishing work for the day (in addition to procedures described above):

- ◆ Where applicable, place disposal coveralls and shoe covers with the abatement waste;
- ◆ Contaminated clothing which is to be cleaned, laundered or disposed of must be placed in closed containers in the change room.

- ◆ Clean protective gear, including respirator, according to standard procedures;
- ◆ Wash hands and face again.

If showers are available, take a shower and wash hair. If shower facilities are not available at the work site, shower immediately at home and wash hair.

(6) Housekeeping—WAC 296-155-17617.

Your employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. Vacuuming is the preferred method of meeting this requirement, and the use of compressed air to clean floors and other surfaces is generally prohibited unless removal with compressed air is done in conjunction with ventilation systems designed to contain dispersal of the lead dust. Dry or wet sweeping, shoveling, or brushing may not be used except where vacuuming or other equally effective methods have been tried and do not work. Vacuums must be used equipped with a special filter called a high-efficiency particulate air (HEPA) filter and emptied in a manner which minimizes the reentry of lead into the workplace.

(7) Hygiene facilities and practices—WAC 296-155-17619.

The standard requires that hand washing facilities be provided where occupational exposure to lead occurs. In addition, change areas, showers (where feasible), and lunchrooms or eating areas are to be made available to workers exposed to lead above the PEL. Your employer must assure that except in these facilities, food and beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied, where airborne exposures are above the PEL. Change rooms provided by your employer must be equipped with separate storage facilities for your protective clothing and equipment and street clothes to avoid cross-contamination. After showering, no required protective clothing or equipment worn during the shift may be worn home. It is important that contaminated clothing or equipment be removed in change areas and not be worn home or you will extend your exposure and expose your family since lead from your clothing can accumulate in your house, car, etc.

Lunchrooms or eating areas may not be entered with protective clothing or equipment unless surface dust has been removed by vacuuming, downdraft booth, or other cleaning method. Finally, workers exposed above the PEL must wash both their hands and faces prior to eating, drinking, smoking or applying cosmetics.

All of the facilities and hygiene practices just discussed are essential to minimize additional sources of lead absorption from inhalation or ingestion of lead that may accumulate on you, your clothes, or your possessions. Strict compliance with these provisions can virtually eliminate several sources of lead exposure which significantly contribute to excessive lead absorption.

(8) Medical surveillance—WAC 296-155-17621.

The medical surveillance program is part of the standard's comprehensive approach to the prevention of lead-related disease. Its purpose is to supplement the main thrust of the standard which is aimed at minimizing airborne concentrations of lead and sources of ingestion. Only medical

surveillance can determine if the other provisions of the standard have affectively protected you as an individual. Compliance with the standard's provision will protect most workers from the adverse effects of lead exposure, but may not be satisfactory to protect individual workers:

- ◆ Who have high body burdens of lead acquired over past years,
- ◆ Who have additional uncontrolled sources of non-occupational lead exposure,
- ◆ Who exhibit unusual variations in lead absorption rates, or
- ◆ Who have specific non-work related medical conditions which could be aggravated by lead exposure (e.g., renal disease, anemia).

In addition, control systems may fail, or hygiene and respirator programs may be inadequate. Periodic medical surveillance of individual workers will help detect those failures. Medical surveillance will also be important to protect your reproductive ability—regardless of whether you are a man or woman.

All medical surveillance required by the standard must be performed by or under the supervision of a licensed physician. The employer must provide required medical surveillance without cost to employees and at a reasonable time and place. The standard's medical surveillance program has two parts—periodic biological monitoring and medical examinations. Your employer's obligation to offer you medical surveillance is triggered by the results of the air monitoring program. Full medical surveillance must be made available to all employees who are or may be exposed to lead in excess of the action level for more than 30 days a year and whose blood lead level exceeds 40 µg/dl. Initial medical surveillance consisting of blood sampling and analysis for lead and zinc protoporphyrin must be provided to all employees exposed at any time (1 day) above the action level.

Biological monitoring under the standard must be provided at least every 2 months for the first 6 months and every 6 months thereafter until your blood lead level is below 40 µg/dl. A zinc protoporphyrin (ZPP) test is a very useful blood test which measures an adverse metabolic effect of lead on your body and is therefore an indicator of lead toxicity.

If your BLL exceeds 40 µg/dl the monitoring frequency must be increased from every 6 months to at least every 2 months and not reduced until two consecutive BLLs indicate a blood lead level below 40 µg/dl. Each time your BLL is determined to be over 40 µg/dl, your employer must notify you of this in writing within five working days of their receipt of the test results. The employer must also inform you that the standard requires temporary medical removal with economic protection when your BLL exceeds 50 µg/dl. (See Discussion of medical removal protection—WAC 296-155-17623.) Anytime your BLL exceeds 50 µg/dl your employer must make available to you within two weeks of receipt of these test results a second follow-up BLL test to confirm your BLL. If the two tests both exceed 50 µg/dl, and you are temporarily removed, then your employer must make successive BLL tests available to you on a monthly basis during the period of your removal.

Medical examinations beyond the initial one must be made available on an annual basis if your blood lead level

exceeds 40 µg/dl at any time during the preceding year and you are being exposed above the airborne action level of 30 µg/m³ for 30 or more days per year. The initial examination will provide information to establish a baseline to which subsequent data can be compared.

An initial medical examination to consist of blood sampling and analysis for lead and zinc protoporphyrin must also be made available (prior to assignment) for each employee being assigned for the first time to an area where the airborne concentration of lead equals or exceeds the action level at any time. In addition, a medical examination or consultation must be made available as soon as possible if you notify your employer that you are experiencing signs or symptoms commonly associated with lead poisoning or that you have difficulty breathing while wearing a respirator or during a respirator fit test. You must also be provided a medical examination or consultation if you notify your employer that you desire medical advice concerning the effects of current or past exposure to lead on your ability to procreate a healthy child.

Finally, appropriate follow-up medical examinations or consultations may also be provided for employees who have been temporarily removed from exposure under the medical removal protection provisions of the standard. (See subsection (9), below.)

The standard specifies the minimum content of pre-assignment and annual medical examinations. The content of other types of medical examinations and consultations is left up to the sound discretion of the examining physician. Pre-assignment and annual medical examinations must include:

- ◆ A detailed work history and medical history;
- ◆ A thorough physical examination, including an evaluation of your pulmonary status if you will be required to use a respirator;
- ◆ A blood pressure measurement; and
- ◆ A series of laboratory tests designed to check your blood chemistry and your kidney function.

In addition, at any time upon your request, a laboratory evaluation of male fertility will be made (microscopic examination of a sperm sample), or a pregnancy test will be given.

The standard does not require that you participate in any of the medical procedures, tests, etc. which your employer is required to make available to you. Medical surveillance can, however, play a very important role in protecting your health. You are strongly encouraged, therefore, to participate in a meaningful fashion. The standard contains a multiple physician review mechanism which will give you a chance to have a physician of your choice directly participate in the medical surveillance program. If you are dissatisfied with an examination by a physician chosen by your employer, you can select a second physician to conduct an independent analysis. The two doctors would attempt to resolve any differences of opinion, and select a third physician to resolve any firm dispute. Generally your employer will choose the physician who conducts medical surveillance under the lead standard—unless you and your employer can agree on the choice of a physician or physicians. Some companies and unions have agreed in advance, for example, to use certain independent medical laboratories or panels of physicians. Any of these arrangements are acceptable so long as required medical surveillance is made available to workers.

The standard requires your employer to provide certain information to a physician to aid in their examination of you. This information includes:

- ◆ The standard and its appendices,
- ◆ A description of your duties as they relate to occupational lead exposure,
- ◆ Your exposure level or anticipated exposure level,
- ◆ A description of any personal protective equipment you wear,
- ◆ Prior blood lead level results, and
- ◆ Prior written medical opinions concerning you that the employer has.

After a medical examination or consultation the physician must prepare a written report which must contain:

- ◆ The physician's opinion as to whether you have any medical condition which places you at increased risk of material impairment to health from exposure to lead,
- ◆ Any recommended special protective measures to be provided to you,
- ◆ Any blood lead level determinations, and
- ◆ Any recommended limitation on your use of respirator.

This last element must include a determination of whether you can wear a powered air purifying respirator (PAPR) if you are found unable to wear a negative pressure respirator.

The medical surveillance program of the lead standard may at some point in time serve to notify certain workers that they have acquired a disease or other adverse medical condition as a result of occupational lead exposure. If this is true, these workers might have legal rights to compensation from public agencies, their employers, firms that supply hazardous products to their employers, or other persons. Some states have laws, including worker compensation laws, that disallow a worker who learns of a job-related health impairment to sue, unless the worker sues within a short period of time after learning of the impairment. (This period of time may be a matter of months or years.) An attorney can be consulted about these possibilities. It should be stressed that WISHA is in no way trying to either encourage or discourage claims or lawsuits. However, since results of the standard's medical surveillance program can significantly affect the legal remedies of a worker who has acquired a job-related disease or impairment, it is proper for WISHA to make you aware of this.

The medical surveillance section of the standard also contains provisions dealing with chelation. Chelation is the use of certain drugs (administered in pill form or injected into the body) to reduce the amount of lead absorbed in body tissues. Experience accumulated by the medical and scientific communities has largely confirmed the effectiveness of this type of therapy for the treatment of very severe lead poisoning. On the other hand, it has also been established that there can be a long list of extremely harmful side effects associated with the use of chelating agents. The medical community has balanced the advantages and disadvantages resulting from the use of chelating agents in various circumstances and has established when the use of these agents is acceptable. The standard includes these accepted limitations due to a history of abuse of chelation therapy by some lead companies. The most widely used chelating agents are calcium disodium

EDTA, (Ca Na₂ EDTA), Calcium Disodium Versenate (Versenate), and d-penicillamine (penicillamine or Cupramine).

The standard prohibits "prophylactic chelation" of any employee by any person the employer retains, supervises or controls. "Prophylactic chelation" is the routine use of chelating or similarly acting drugs to prevent elevated blood levels in workers who are occupationally exposed to lead, or the use of these drugs to routinely lower blood lead levels to pre-designated concentrations believed to be "safe". It should be emphasized that where an employer takes a worker who has no symptoms of lead poisoning and has chelation carried out by a physician (either inside or outside of a hospital) solely to reduce the worker's blood lead level, that will generally be considered prophylactic chelation. The use of a hospital and a physician does not mean that prophylactic chelation is not being performed. Routine chelation to prevent increased or reduce current blood lead levels is unacceptable whatever the setting.

The standard allows the use of "therapeutic" or "diagnostic" chelation if administered under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring. Therapeutic chelation responds to severe lead poisoning where there are marked symptoms. Diagnostic chelation involved giving a patient a dose of the drug then collecting all urine excreted for some period of time as an aid to the diagnosis of lead poisoning.

In cases where the examining physician determines that chelation is appropriate, you must be notified in writing of this fact before such treatment. This will inform you of a potentially harmful treatment, and allow you to obtain a second opinion.

(9) Medical removal protection—WAC 296-155-17623.

Excessive lead absorption subjects you to increased risk of disease. Medical removal protection (MRP) is a means of protecting you when, for whatever reasons, other methods, such as engineering controls, work practices, and respirator, have failed to provide the protection you need. MRP involves the temporary removal of a worker from their regular job to a place of significantly lower exposure without any loss of earnings, seniority, or other employment rights or benefits. The purpose of this program is to cease further lead absorption and allow your body to naturally excrete lead which has previously been absorbed. Temporary medical removal can result from an elevated blood lead level, or a medical opinion. For up to 18 months, or for as long as the job the employee was removed from lasts, protection is provided as a result of either form of removal. The vast majority of removed workers, however, will return to their former jobs long before this eighteen month period expires.

You may also be removed from exposure even if your blood lead level is below 50 µ/dl if a final medical determination indicates that you temporarily need reduced lead exposure for medical reasons. If the physician who is implementing your employers medical program makes a final written opinion recommending your removal or other special protective measures, your employer must implement the physician's recommendation. If you are removed in this manner, you may only be returned when the doctor indicates that it is safe for you to do so.

The standard does not give specific instructions dealing with what an employer must do with a removed worker. Your job assignment upon removal is a matter for you, your employer and your union (if any) to work out consistent with existing procedures for job assignments. Each removal must be accomplished in a manner consistent with existing collective bargaining relationships. Your employer is given broad discretion to implement temporary removals so long as no attempt is made to override existing agreements. Similarly, a removed worker is provided no right to veto an employer's choice which satisfies the standard.

In most cases, employers will likely transfer removed employees to other jobs with sufficiently low lead exposure. Alternatively, a worker's hours may be reduced so that the time weighted average exposure is reduced, or they may be temporarily laid off if no other alternative is feasible.

In all of these situation, MRP benefits must be provided during the period of removal—i.e., you continue to receive the same earnings, seniority, and other rights and benefits you would have had if you had not been removed. Earnings includes more than just your base wage; it includes overtime, shift differentials, incentives, and other compensation you would have earned if you had not been removed. During the period of removal you must also be provided with appropriate follow-up medical surveillance. If you were removed because your blood lead level was too high, you must be provided with a monthly blood test. If a medical opinion caused your removal, you must be provided medical tests or examinations that the doctor believes to be appropriate. If you do not participate in this follow up medical surveillance, you may lose your eligibility for MRP benefits.

When you are medically eligible to return to your former job, your employer must return you to your "former job status." This means that you are entitled to the position, wages, benefits, etc., you would have had if you had not been removed. If you would still be in your old job if no removal had occurred that is where you go back. If not, you are returned consistent with whatever job assignment discretion your employer would have had if no removal had occurred. MRP only seeks to maintain your rights, not expand them or diminish them.

If you are removed under MRP and you are also eligible for worker compensation or other compensation for lost wages, your employer's MRP benefits obligation is reduced by the amount that you actually receive from these other sources. This is also true if you obtain other employment during the time you are laid off with MRP benefits.

The standard also covers situations where an employer voluntarily removes a worker from exposure to lead due to the effects of lead on the employee's medical condition, even though the standard does not require removal. In these situations MRP benefits must still be provided as though the standard required removal. Finally, it is important to note that in all cases where removal is required, respirator cannot be used as a substitute. Respirator may be used before removal becomes necessary, but not as an alternative to a transfer to a low exposure job, or to a lay-off with MRP benefits.

(10) Employee information and training—WAC 296-155-17625.

[Title 296 WAC—p. 2136]

Your employer is required to provide an information and training program for all employees exposed to lead above the action level or who may suffer skin or eye irritation from lead compounds such as lead arsenate or lead azide. The program must train these employees regarding the specific hazards associated with their work environment, protective measures which can be taken, including the contents of any compliance plan in effect, the danger of lead to their bodies (including their reproductive systems), and their rights under the standard. All employees must be trained prior to initial assignment to areas where there is a possibility of exposure over the action level.

This training program must also be provided at least annually thereafter unless further exposure above the action level will not occur.

(11) Signs—WAC 296-155-17627.

The standard requires that the following warning sign be posted in work areas where the exposure to lead exceeds the PEL:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

These signs are to be posted and maintained in a manner which assures that the legend is readily visible.

(12) Recordkeeping—WAC 296-155-17629.

Your employer is required to keep all records of exposure monitoring for airborne lead. These records must include the name and job classification of employees measured, details of the sampling and analytical techniques, the results of this sampling, and the type of respiratory protection being worn by the person sampled. Such records are to be retained for at least 30 years. Your employer is also required to keep all records of biological monitoring and medical examination results. These records must include the names of the employees, the physician's written opinion, and a copy of the results of the examination. Medical records must be preserved and maintained for the duration of employment plus 30 years. However, if the employee's duration of employment is less than one year, the employer need not retain that employee's medical records beyond the period of employment if they are provided to the employee upon termination of employment.

Recordkeeping is also required if you are temporarily removed from your job under the medical removal protection program. This record must include your name and Social Security number, the date of your removal and return, how the removal was or is being accomplished, and whether or not the reason for the removal was an elevated blood lead level. Your employer is required to keep each medical removal record only for as long as the duration of an employee's employment.

The standard requires that if you request to see or copy environmental monitoring, blood lead level monitoring, or medical removal records, they must be made available to you or to a representative that you authorize. Your union also has access to these records. Medical records other than BLL's must also be provided upon request to you, to your physician or to any other person whom you may specifically designate.

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Your union does not have access to your personal medical records unless you authorize their access.

(13) Observation of monitoring—WAC 296-155-17631.

When air monitoring for lead is performed at your workplace as required by this standard, your employer must allow you or someone you designate to act as an observer of the monitoring. Observers are entitled to an explanation of the measurement procedure, and to record the results obtained. Since results will not normally be available at the time of the monitoring, observers are entitled to record or receive the results of the monitoring when returned by the laboratory. Your employer is required to provide the observer with any personal protective devices required to be worn by employees working in the area that is being monitored. The employer must require the observer to wear all such equipment and to comply with all other applicable safety and health procedures.

(14) Startup date—WAC 296-155-17635.

Employer obligations under the standard begin as of that date with full implementation of engineering controls as soon as possible but no later than within 4 months, and all other provisions completed as soon as possible, but no later than within 2 months from the effective date.

(15) For additional information.

(a) A copy of the standard for lead in construction can be obtained free of charge by calling or writing to the department of labor and industries, Post Office Box 44620, Mail-stop 44620, Olympia, Washington 98504-4620: Telephone (360) 956-5527.

(b) Additional information about the standard, its enforcement, and your employer's compliance can be obtained from the nearest office listed in your telephone directory under the state of Washington, department of labor and industries.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17652, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17654 Appendix C to WAC 296-155-176—Medical surveillance guidelines. (1) Introduction.

The primary purpose of the Washington Industrial Safety and Health Act of 1973 is to assure, so far as possible, safe and healthful working conditions for every working man and woman. The occupational health standard for lead in construction is designed to protect workers exposed to inorganic lead including metallic lead, all inorganic lead compounds and organic lead soaps.

Under this standard occupational exposure to inorganic lead is to be limited to 50 $\mu\text{g}/\text{m}^3$ (micrograms per cubic meter) based on an 8 hour time-weighted average (TWA). This permissible exposure limit (PEL) must be achieved through a combination of engineering, work practice and administrative controls to the extent feasible. Where these controls are in place but are found not to reduce employee exposures to or below the PEL, they must be used nonetheless, and supplemented with respirators to meet the 50 $\mu\text{g}/\text{m}^3$ exposure limit.

The standard also provides for a program of biological monitoring for employees exposed to lead above the action level at any time, and additional medical surveillance for all employees exposed to levels of inorganic lead above 30

$\mu\text{g}/\text{m}^3$ (TWA) for more than 30 days per year and whose BLL exceeds 40 $\mu\text{g}/\text{dl}$.

The purpose of this document is to outline the medical surveillance provisions of the standard for inorganic lead in construction, and to provide further information to the physician regarding the examination and evaluation of workers exposed to inorganic lead.

Subsection (2) provides a detailed description of the monitoring procedure including the required frequency of blood testing for exposed workers, provisions for medical removal protection (MRP), the recommended right of the employee to a second medical opinion, and notification and recordkeeping requirements of the employer. A discussion of the requirements for respirator use and respirator monitoring and WISHA's position on prophylactic chelation therapy are also included in this subsection.

Subsection (3) discusses the toxic effects and clinical manifestations of lead poisoning and effects of lead intoxication on enzymatic pathways in heme synthesis. The adverse effects on both male and female reproductive capacity and on the fetus are also discussed.

Subsection (4) outlines the recommended medical evaluation of the worker exposed to inorganic lead, including details of the medical history, physical examination, and recommended laboratory tests, which are based on the toxic effects of lead as discussed in subsection (3).

Subsection (5) provides detailed information concerning the laboratory tests available for the monitoring of exposed workers. Included also is a discussion of the relative value of each test and the limitations and precautions which are necessary in the interpretation of the laboratory results.

(2) Medical surveillance and monitoring requirements for workers exposed to inorganic lead.

Under the standard for inorganic lead in the construction industry, initial medical surveillance consisting of biological monitoring to include blood lead and ZPP level determination shall be provided to employees exposed to lead at or above the action level on any one day. In addition, a program of biological monitoring is to be made available to all employees exposed above the action level at any time and additional medical surveillance is to be made available to all employees exposed to lead above 30 $\mu\text{g}/\text{m}^3$ TWA for more than 30 days each year and whose BLL exceeds 40 $\mu\text{g}/\text{dl}$. This program consists of periodic blood sampling and medical evaluation to be performed on a schedule which is defined by previous laboratory results, worker complaints or concerns, and the clinical assessment of the examining physician.

Under this program, the blood lead level (BLL) of all employees who are exposed to lead above 30 $\mu\text{g}/\text{m}^3$ for more than 30 days per year or whose blood lead is above 40 $\mu\text{g}/\text{dl}$ but exposed for no more than 30 days per year is to be determined at least every two months for the first six months of exposure and every six months thereafter. The frequency is increased to every two months for employees whose last blood lead level was 40 $\mu\text{g}/\text{dl}$ or above. For employees who are removed from exposure to lead due to an elevated blood lead, a new blood lead level must be measured monthly. A zinc protoporphyrin (ZPP) measurement is strongly recom-

mended on each occasion that a blood lead level measurement is made.

An annual medical examination and consultation performed under the guidelines discussed in subsection (4) is to be made available to each employee exposed above $30 \mu\text{g}/\text{m}^3$ for more than 30 days per year for whom a blood test conducted at any time during the preceding 12 months indicated a blood lead level at or above $40 \mu\text{g}/\text{dl}$. Also, an examination is to be given to all employees prior to their assignment to an area in which airborne lead concentrations reach or exceed the $30 \mu\text{g}/\text{m}^3$ for more than 30 days per year. In addition, a medical examination must be provided as soon as possible after notification by an employee that the employee has developed signs or symptoms commonly associated with lead intoxication, that the employee desires medical advice regarding lead exposure and the ability to procreate a healthy child, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during respirator use. An examination is also to be made available to each employee removed from exposure to lead due to a risk of sustaining material impairment to health, or otherwise limited or specially protected pursuant to medical recommendations.

Results of biological monitoring or the recommendations of an examining physician may necessitate removal of an employee from further lead exposure pursuant to the standard's medical removal protection (MRP) program. The object of the MRP program is to provide temporary medical removal to workers either with substantially elevated blood lead levels or otherwise at risk of sustaining material health impairment from continued substantial exposure to lead.

Under the standard's ultimate worker removal criteria, a worker is to be removed from any work having an eight hour TWA exposure to lead of $30 \mu\text{g}/\text{m}^3$ when their blood lead level reaches $50 \mu\text{g}/\text{dl}$ and is confirmed by a second follow-up blood lead level performed within two weeks after the employer receives the results of the first blood sampling test. Return of the employee to their job status depends on a worker's blood lead level declining to $40 \mu\text{g}/\text{dl}$.

As part of the standard, the employer is required to notify in writing each employee whose blood lead level exceeds $40 \mu\text{g}/\text{dl}$. In addition each such employee is to be informed that the standard requires medical removal with MRP benefits, discussed below, when an employee's blood lead level exceeds the above defined limit.

In addition to the above blood lead level criterion, temporary worker removal may also take place as a result of medical determinations and recommendations. Written medical opinions must be prepared after each examination pursuant to the standard. If the examining physician includes a medical finding, determination or opinion that the employee has a medical condition which places the employee at increased risk of material health impairment from exposure to lead, then the employee must be removed from exposure to lead at or above $30 \mu\text{g}/\text{m}^3$. Alternatively, if the examining physician recommends special protective measures for an employee (e.g., use of a powered air purifying respirator) or recommends limitations on an employee's exposure to lead, then the employer must implement these recommendations.

Recommendations may be more stringent than the specific provisions of the standard. The examining physician, therefore, is given broad flexibility to tailor special protective procedures to the needs of individual employees. This flexibility extends to the evaluation and management of pregnant workers and male and female workers who are planning to raise children. Based on the history, physical examination, and laboratory studies, the physician might recommend special protective measures or medical removal for an employee who is pregnant or who is planning to conceive a child when, in the physician's judgment, continued exposure to lead at the current job would pose a significant risk. The return of the employee to their former job status, or the removal of special protections or limitations, depends upon the examining physician determining that the employee is no longer at increased risk of material impairment or that special measures are no longer needed.

During the period of any form of special protection or removal, the employer must maintain the worker's earnings, seniority, and other employment rights and benefits (as though the worker had not been removed) for a period of up to 18 months or for as long as the job the employee was removed from lasts if less than 18 months. This economic protection will maximize meaningful worker participation in the medical surveillance program, and is appropriate as part of the employer's overall obligation to provide a safe and healthful workplace. The provisions of MRP benefits during the employee's removal period may, however, be conditioned upon participation in medical surveillance.

The lead standard provides for a multiple physician review in cases where the employee wishes a second opinion concerning potential lead poisoning or toxicity. If an employee wishes a second opinion, they can make an appointment with a physician of their choice. This second physician will review the findings, recommendations or determinations of the first physician and conduct any examinations, consultations or tests deemed necessary in an attempt to make a final medical determination. If the first and second physicians do not agree in their assessment they must try to resolve their differences. If they cannot reach an agreement then they must designate a third physician to resolve the dispute.

The employer must provide examining and consulting physicians with the following specific information: A copy of the lead regulations and all appendices, a description of the employee's duties as related to exposure, the exposure level or anticipated level to lead and any other toxic substances (if applicable), a description of personal protective equipment used, blood lead levels, and all prior written medical opinions regarding the employee in the employer's possession or control. The employer must also obtain from the physician and provide the employee with a written medical opinion containing blood lead levels, the physicians's opinion as to whether the employee is at risk of material impairment to health, any recommended protective measures for the employee if further exposure is permitted, as well as any recommended limitations upon an employee's use of respirators.

Employers must instruct each physician not to reveal to the employer in writing or in any other way their findings, laboratory results, or diagnoses which are felt to be unrelated

to occupational lead exposure. They must also instruct each physician to advise the employee of any occupationally or non-occupationally related medical condition requiring further treatment or evaluation.

The standard provides for the use of respirators where engineering and other primary controls are not effective. However, the use of respirator protection shall not be used in lieu of temporary medical removal due to elevated blood lead levels or findings that an employee is at risk of material health impairment. This is based on the numerous inadequacies of respirators including skin rash where the facepiece makes contact with the skin, unacceptable stress to breathing in some workers with underlying cardiopulmonary impairment, difficulty in providing adequate fit, the tendency for respirators to create additional hazards by interfering with vision, hearing, and mobility, and the difficulties of assuring the maximum effectiveness of a complicated work practice program involving respirators. Respirators do, however, serve a useful function where engineering and work practice controls are inadequate by providing supplementary, interim, or short-term protection, provided they are properly selected for the environment in which the employee will be working, properly fitted to the employee, maintained and cleaned periodically, and worn by the employee when required.

In its standard on occupational exposure to inorganic lead in the construction industry, WISHA has prohibited prophylactic chelation. Diagnostic and therapeutic chelation are permitted only under the supervision of a licensed physician with appropriate medical monitoring in an acceptable clinical setting. The decision to initiate chelation therapy must be made on an individual basis and take into account the severity of symptoms felt to be a result of lead toxicity along with blood lead levels, ZPP levels, and other laboratory tests as appropriate. EDTA and penicillamine which are the primary chelating agents used in the therapy of occupational lead poisoning have significant potential side effects and their use must be justified on the basis of expected benefits to the worker. Unless frank and severe symptoms are present, therapeutic chelation is not recommended, given the opportunity to remove a worker from exposure and allow the body to naturally excrete accumulated lead. As a diagnostic aid, the chelation mobilization test using CA-EDTA has limited applicability. According to some investigators, the test can differentiate between lead-induced and other nephropathies. The test may also provide an estimation of the mobile fraction of the total body lead burden.

Employers are required to assure that accurate records are maintained on exposure assessment, including environmental monitoring, medical surveillance, and medical removal for each employee. Exposure assessment records must be kept for at least 30 years. Medical surveillance records must be kept for the duration of employment plus 30 years except in cases where the employment was less than one year. If duration of employment is less than one year, the employer need not retain this record beyond the term of employment if the record is provided to the employee upon termination of employment. Medical removal records also must be maintained for the duration of employment. All records required under the standard must be made available upon request to the director. Employers must also make envi-

ronmental and biological monitoring and medical removal records available to affected employees and to former employees or their authorized employee representatives. Employees or their specifically designated representatives have access to their entire medical surveillance records.

In addition, the standard requires that the employer inform all workers exposed to lead at or above $30 \mu\text{g}/\text{m}^3$ of the provisions of the standard and all its appendices, the purpose and description of medical surveillance and provisions for medical removal protection if temporary removal is required. An understanding of the potential health effects of lead exposure by all exposed employees along with full understanding of their rights under the lead standard is essential for an effective monitoring program.

(3) Adverse health effects of inorganic lead.

Although the toxicity of lead has been known for 2,000 years, the knowledge of the complex relationship between lead exposure and human response is still being refined. Significant research into the toxic properties of lead continues throughout the world, and it should be anticipated that our understanding of thresholds of effects and margins of safety will be improved in future years. The provisions of the lead standard are founded on two prime medical judgments: First, the prevention of adverse health effects from exposure to lead throughout a working lifetime requires that worker blood lead levels be maintained at or below $40 \mu\text{g}/\text{dl}$ and second, the blood lead levels of workers, male or female, who intend to parent in the near future should be maintained below $30 \mu\text{g}/\text{dl}$ to minimize adverse reproductive health effects to the parents and developing fetus. The adverse effects of lead on reproduction are being actively researched and WISHA encourages the physician to remain abreast of recent developments in the area to best advise pregnant workers or workers planning to conceive children.

The spectrum of health effects caused by lead exposure can be subdivided into five developmental stages: Normal, physiological changes of uncertain significance, pathophysiological changes, overt symptoms (morbidity), and mortality. Within this process there are no sharp distinctions, but rather a continuum of effects. Boundaries between categories overlap due to the wide variation of individual responses and exposures in the working population. WISHA's development of the lead standard focused on pathophysiological changes as well as later stages of disease.

(a) Heme synthesis inhibition. The earliest demonstrated effect of lead involves its ability to inhibit at least two enzymes of the heme synthesis pathway at very low blood levels. Inhibition of delta aminolevulinic acid dehydrase (ALA-D) which catalyzes the conversion of delta-aminolevulinic acid (ALA) to protoporphyrin is observed at a blood lead level below $20 \mu\text{g}/\text{dl}$. At a blood lead level of $40 \mu\text{g}/\text{dl}$, more than 20% of the population would have 70% inhibition of ALA-D. There is an exponential increase in ALA excretion at blood lead levels greater than $40 \mu\text{g}/\text{dl}$.

Another enzyme, ferrochelatase, is also inhibited at low blood lead levels. Inhibition of ferrochelatase leads to increased free erythrocyte protoporphyrin (FEP) in the blood which can then bind to zinc to yield zinc protoporphyrin. At a blood lead level of $50 \mu\text{g}/\text{dl}$ or greater, nearly 100% of the

population will have an increase in FEP. There is also an exponential relationship between blood lead levels greater than 40 µg/dl and the associated ZPP level, which has led to the development of the ZPP screening test for lead exposure.

While the significance of these effects is subject to debate, it is WISHA's position that these enzyme disturbances are early stages of a disease process which may eventually result in the clinical symptoms of lead poisoning. Whether or not the effects do progress to the later stages of clinical disease, disruption of these enzyme processes over a working lifetime is considered to be a material impairment of health.

One of the eventual results of lead-induced inhibition of enzymes in the heme synthesis pathway is anemia which can be asymptomatic if mild but associated with a wide array of symptoms including dizziness, fatigue, and tachycardia when more severe. Studies have indicated that lead levels as low as 50 µg/dl can be associated with a definite decreased hemoglobin, although most cases of lead-induced anemia, as well as shortened red-cell survival times, occur at lead levels exceeding 80 µg/dl. Inhibited hemoglobin synthesis is more common in chronic cases whereas shortened erythrocyte life span is more common in acute cases.

In lead-induced anemias, there is usually a reticulocytosis along with the presence of basophilic stippling, and ringed sideroblasts, although none of the above are pathognomonic for lead-induced anemia.

(b) Neurological effects. Inorganic lead has been found to have toxic effects on both the central and peripheral nervous systems. The earliest stages of lead-induced central nervous system effects first manifest themselves in the form of behavioral disturbances and central nervous system symptoms including irritability, restlessness, insomnia and other sleep disturbances, fatigue, vertigo, headache, poor memory, tremor, depression, and apathy. With more severe exposure, symptoms can progress to drowsiness, stupor, hallucinations, delirium, convulsions and coma.

The most severe and acute form of lead poisoning which usually follows ingestion or inhalation of large amounts of lead is acute encephalopathy which may arise precipitously with the onset of intractable seizures, coma, cardiorespiratory arrest, and death within 48 hours.

While there is disagreement about what exposure levels are needed to produce the earliest symptoms, most experts agree that symptoms definitely can occur at blood lead levels of 60 µg/dl whole blood and therefore recommend a 40 µg/dl maximum. The central nervous system effects frequently are not reversible following discontinued exposure or chelation therapy and when improvement does occur, it is almost always only partial.

The peripheral neuropathy resulting from lead exposure characteristically involves only motor function with minimal sensory damage and has a marked predilection for the extensor muscles of the most active extremity. The peripheral neuropathy can occur with varying degrees of severity. The earliest and mildest form which can be detected in workers with blood lead levels as low as 50 µg/dl is manifested by slowing of motor nerve conduction velocity often without clinical symptoms. With progression of the neuropathy there is devel-

opment of painless extensor muscle weakness usually involving the extensor muscles of the fingers and hand in the most active upper extremity, followed in severe cases by wrist drop or, much less commonly, foot drop.

In addition to slowing of nerve conduction, electromyographical studies in patients with blood lead levels greater than 50 µg/dl have demonstrated a decrease in the number of acting motor unit potentials, an increase in the duration of motor unit potentials, and spontaneous pathological activity including fibrillations and fasciculations. Whether these effects occur at levels of 40 µg/dl is undetermined.

While the peripheral neuropathies can occasionally be reversed with therapy, again such recovery is not assured particularly in the more severe neuropathies and often improvement is only partial. The lack of reversibility is felt to be due in part to segmental demyelination.

(c) Gastrointestinal. Lead may also affect the gastrointestinal system producing abdominal colic or diffuse abdominal pain, constipation, obstipation, diarrhea, anorexia, nausea and vomiting. Lead colic rarely develops at blood lead levels below 80 µg/dl.

(d) Renal. Renal toxicity represents one of the most serious health effects of lead poisoning. In the early stages of disease nuclear inclusion bodies can frequently be identified in proximal renal tubular cells. Renal function remains normal and the changes in this stage are probably reversible. With more advanced disease there is progressive interstitial fibrosis and impaired renal function. Eventually extensive interstitial fibrosis ensues with sclerotic glomeruli and dilated and atrophied proximal tubules; all represent end stage kidney disease. Azotemia can be progressive, eventually resulting in frank uremia necessitating dialysis. There is occasionally associated hypertension and hyperuricemia with or without gout.

Early kidney disease is difficult to detect. The urinalysis is normal in early lead nephropathy and the blood urea nitrogen and serum creatinine increase only when two-thirds of kidney function is lost. Measurement of creatinine clearance can often detect earlier disease as can other methods of measurement of glomerular filtration rate. An abnormal Ca-EDTA mobilization test has been used to differentiate between lead-induced and other nephropathies, but this procedure is not widely accepted. A form of Fanconi syndrome with aminoaciduria, glycosuria, and hyperphosphaturia indicating severe injury to the proximal renal tubules is occasionally seen in children.

(e) Reproductive effects. Exposure to lead can have serious effects on reproductive function in both males and females. In male workers exposed to lead there can be a decrease in sexual drive, impotence, decreased ability to produce healthy sperm, and sterility. Malformed sperm (teratospermia), decreased number of sperm (hypospermia), and sperm with decreased motility (asthenospermia) can all occur. Teratospermia has been noted at mean blood lead levels of 53 µg/dl and hypospermia and asthenospermia at 41 µg/dl. Furthermore, there appears to be a dose-response relationship for teratospermia in lead exposed workers.

Women exposed to lead may experience menstrual disturbances including dysmenorrhea, menorrhagia and amen-

orrhoea. Following exposure to lead, women have a higher frequency of sterility, premature births, spontaneous miscarriages, and stillbirths.

Germ cells can be affected by lead and cause genetic damage in the egg or sperm cells before conception and result in failure to implant, miscarriage, stillbirth, or birth defects.

Infants of mothers with lead poisoning have a higher mortality during the first year and suffer from lowered birth weights, slower growth, and nervous system disorders.

Lead can pass through the placental barrier and lead levels in the mother's blood are comparable to concentrations of lead in the umbilical cord at birth. Transplacental passage becomes detectable at 12-14 weeks of gestation and increases until birth.

There is little direct data on damage to the fetus from exposure to lead but it is generally assumed that the fetus and newborn would be at least as susceptible to neurological damage as young children. Blood lead levels of 50-60 µg/dl in children can cause significant neurobehavioral impairments and there is evidence of hyperactivity at blood levels as low as 25 µg/dl. Given the overall body of literature concerning the adverse health effects of lead in children, WISHA feels that the blood lead level in children should be maintained below 30 µg/dl with a population mean of 15 µg/dl. Blood lead levels in the fetus and newborn likewise should not exceed 30 µg/dl.

Because of lead's ability to pass through the placental barrier and also because of the demonstrated adverse effects of lead on reproductive function in both the male and female as well as the risk of genetic damage of lead on both the ovum and sperm, WISHA recommends a 30 µg/dl maximum permissible blood lead level in both males and females who wish to bear children.

(f) Other toxic effects. Debate and research continue on the effects of lead on the human body. Hypertension has frequently been noted in occupationally exposed individuals although it is difficult to assess whether this is due to lead's adverse effects on the kidney or if some other mechanism is involved. Vascular and electrocardiographic changes have been detected but have not been well characterized. Lead is thought to impair thyroid function and interfere with the pituitary-adrenal axis, but again these effects have not been well defined.

(4) Medical evaluation.

The most important principle in evaluating a worker for any occupational disease including lead poisoning is a high index of suspicion on the part of the examining physician. As discussed in section (3), lead can affect numerous organ systems and produce a wide array of signs and symptoms, most of which are non-specific and subtle in nature at least in the early stages of disease. Unless serious concern for lead toxicity is present, many of the early clues to diagnosis may easily be overlooked.

The crucial initial step in the medical evaluation is recognizing that a worker's employment can result in exposure to lead. The worker will frequently be able to define exposures to lead and lead containing materials but often will not volunteer this information unless specifically asked. In other situations the worker may not know of any exposures to lead

but the suspicion might be raised on the part of the physician because of the industry or occupation of the worker. Potential occupational exposure to lead and its compounds occur in many occupations in the construction industry, including demolition and salvaging operations, removal or encapsulation of materials containing lead, construction, alteration, repair or renovation of structures containing lead, transportation, disposal, storage or containment of lead or lead-containing materials on construction sites, and maintenance operations associated with construction activities.

Once the possibility for lead exposure is raised, the focus can then be directed toward eliciting information from the medical history, physical exam, and finally from laboratory data to evaluate the worker for potential lead toxicity.

A complete and detailed work history is important in the initial evaluation. A listing of all previous employment with information on job description, exposure to fumes or dust, known exposures to lead or other toxic substances, a description of any personal protective equipment used, and previous medical surveillance should all be included in the worker's record. Where exposure to lead is suspected, information concerning on-the-job personal hygiene, smoking or eating habits in work areas, laundry procedures, and use of any protective clothing or respiratory protection equipment should be noted. A complete work history is essential in the medical evaluation of a worker with suspected lead toxicity, especially when long term effects such as neurotoxicity and nephrotoxicity are considered.

The medical history is also of fundamental importance and should include a listing of all past and current medical conditions, current medications including proprietary drug intake, previous surgeries and hospitalizations, allergies, smoking history, alcohol consumption, and also non-occupational lead exposures such as hobbies (hunting, riflery). Also known childhood exposures should be elicited. Any previous history of hematological, neurological, gastrointestinal, renal, psychological, gynecological, genetic, or reproductive problems should be specifically noted.

A careful and complete review of systems must be performed to assess both recognized complaints and subtle or slowly acquired symptoms which the worker might not appreciate as being significant. The review of symptoms should include the following:

- ◆ General—weight loss, fatigue, decreased appetite.
- ◆ Head, eyes, ears, nose, throat (HEENT)—headaches, visual disturbances or decreased visual acuity, hearing deficits or tinnitus, pigmentation of the oral mucosa, or metallic taste in mouth.
- ◆ Cardio-pulmonary—shortness of breath, cough, chest pains, palpitations, or orthopnea.
- ◆ Gastrointestinal—nausea, vomiting, heartburn, abdominal pain, constipation or diarrhea.
- ◆ Neurologic—irritability, insomnia, weakness (fatigue), dizziness, loss of memory, confusion, hallucinations, incoordination, ataxia, decreased strength in hands or feet, disturbances in gait, difficulty in climbing stairs, or seizures.
- ◆ Hematologic—pallor, easy fatigability, abnormal blood loss, melena.
- ◆ Reproductive (male and female and spouse where relevant)—history of infertility, impotence, loss of

libido, abnormal menstrual periods, history of miscarriages, stillbirths, or children with birth defects.

- ✦ Musculo-skeletal—muscle and joint pains.

The physical examination should emphasize the neurological, gastrointestinal, and cardiovascular systems. The worker's weight and blood pressure should be recorded and the oral mucosa checked for pigmentation characteristic of a possible Burtonian or lead line on the gingiva. It should be noted, however, that the lead line may not be present even in severe lead poisoning if good oral hygiene is practiced.

The presence of pallor on skin examination may indicate an anemia which, if severe, might also be associated with a tachycardia. If an anemia is suspected, an active search for blood loss should be undertaken including potential blood loss through the gastrointestinal tract.

A complete neurological examination should include an adequate mental status evaluation including a search for behavioral and psychological disturbances, memory testing, evaluation for irritability, insomnia, hallucinations, and mental clouding. Gait and coordination should be examined along with close observation for tremor. A detailed evaluation of peripheral nerve function including careful sensory and motor function testing is warranted. Strength testing particularly of extensor muscle groups of all extremities is of fundamental importance.

Cranial nerve evaluation should also be included in the routine examination.

The abdominal examination should include auscultation for bowel sounds and abdominal bruits and palpation for organomegaly, masses, and diffuse abdominal tenderness.

Cardiovascular examination should evaluate possible early signs of congestive heart failure. Pulmonary status should be addressed particularly if respirator protection is contemplated.

As part of the medical evaluation, the lead standard requires the following laboratory studies:

- ✦ Blood lead level.
- ✦ Hemoglobin and hematocrit determinations, red cell indices, and examination of the peripheral blood smear to evaluate red blood cell morphology.
- ✦ Blood urea nitrogen.
- ✦ Serum creatinine.
- ✦ Routine urinalysis with microscopic examination.
- ✦ A zinc protoporphyrin level.

In addition to the above, the physician is authorized to order any further laboratory or other tests which they deem necessary in accordance with sound medical practice. The evaluation must also include pregnancy testing or laboratory evaluation of male fertility if requested by the employee. Additional tests which are probably not warranted on a routine basis but may be appropriate when blood lead and ZPP levels are equivocal include delta aminolevulinic acid and coproporphyrin concentrations in the urine, and dark-field illumination for detection of basophilic stippling in red blood cells.

If an anemia is detected further studies including a careful examination of the peripheral smear, reticulocyte count, stool for occult blood, serum iron, total iron binding capacity, bilirubin, and, if appropriate, vitamin B12 and folate may be of value in attempting to identify the cause of the anemia.

If a peripheral neuropathy is suspected, nerve conduction studies are warranted both for diagnosis and as a basis to monitor any therapy.

If renal disease is questioned, a 24 hour urine collection for creatinine clearance, protein, and electrolytes may be indicated. Elevated uric acid levels may result from lead-induced renal disease and a serum uric acid level might be performed.

An electrocardiogram and chest x-ray may be obtained as deemed appropriate.

Sophisticated and highly specialized testing should not be done routinely and where indicated should be under the direction of a specialist.

(5) Laboratory evaluation.

The blood lead level at present remains the single most important test to monitor lead exposure and is the test used in the medical surveillance program under the lead standard to guide employee medical removal. The ZPP has several advantages over the blood lead level. Because of its relatively recent development and the lack of extensive data concerning its interpretation, the ZPP currently remains an ancillary test.

This section will discuss the blood lead level and ZPP in detail and will outline their relative advantages and disadvantages. Other blood tests currently available to evaluate lead exposure will also be reviewed.

The blood lead level is a good index of current or recent lead absorption when there is no anemia present and when the worker has not taken any chelating agents. However, blood lead levels along with urinary lead levels do not necessarily indicate the total body burden of lead and are not adequate measures of past exposure. One reason for this is that lead has a high affinity for bone and up to 90% of the body's total lead is deposited there. A very important component of the total lead body burden is lead in soft tissue (liver, kidney, and brain). This fraction of the lead body burden, the biologically active lead, is not entirely reflected by blood lead levels since it is a function of the dynamics of lead absorption, distribution, deposition in bone and excretion. Following discontinuation of exposure to lead, the excess body burden is only slowly mobilized from bone and other relatively stable body stores and excreted. Consequently, a high blood lead level may only represent recent heavy exposure to lead without a significant total body excess and likewise a low blood lead level does not exclude an elevated total body burden of lead.

Also due to its correlation with recent exposures, the blood lead level may vary considerably over short time intervals.

To minimize laboratory error and erroneous results due to contamination, blood specimens must be carefully collected after thorough cleaning of the skin with appropriate methods using lead-free blood containers and analyzed by a reliable laboratory. Under the standard, samples must be analyzed in laboratories which are approved by OSHA. Analysis is to be made using atomic absorption spectrophotometry, anodic stripping voltammetry or any method which meets the accuracy requirements set forth by the standard.

The determination of lead in urine is generally considered a less reliable monitoring technique than analysis of whole blood primarily due to individual variability in urinary excretion capacity as well as the technical difficulty of

obtaining accurate 24 hour urine collections. In addition, workers with renal insufficiency, whether due to lead or some other cause, may have decreased lead clearance and consequently urine lead levels may underestimate the true lead burden. Therefore, urine lead levels should not be used as a routine test.

The zinc protoporphyrin test, unlike the blood lead determination, measures an adverse metabolic effect of lead and as such is a better indicator of lead toxicity than the level of blood lead itself. The level of ZPP reflects lead absorption over the preceding 3 to 4 months, and therefore is a better indicator of lead body burden. The ZPP requires more time than the blood lead to read significantly elevated levels; the return to normal after discontinuing lead exposure is also slower. Furthermore, the ZPP test is simpler, faster, and less expensive to perform and no contamination is possible. Many investigators believe it is the most reliable means of monitoring chronic lead absorption.

Zinc protoporphyrin results from the inhibition of the enzyme ferrochelatase which catalyzes the insertion of an iron molecule into the protoporphyrin molecule, which then becomes heme. If iron is not inserted into the molecule then zinc, having a greater affinity for protoporphyrin, takes the place of the iron, forming ZPP.

An elevation in the level of circulating ZPP may occur at blood lead levels as low as 20-30 $\mu\text{g}/\text{dl}$ in some workers. Once the blood lead level has reached 40 $\mu\text{g}/\text{dl}$ there is more marked rise in the ZPP value from its normal range of less than 100 $\mu\text{g}/\text{dl}$ 100 ml. Increases in blood lead levels beyond 40 $\mu\text{g}/100\text{ g}$ are associated with exponential increases in ZPP.

Whereas blood lead levels fluctuate over short time spans, ZPP levels remain relatively stable. ZPP is measured directly in red blood cells and is present for the cell's entire 120 day life-span. Therefore, the ZPP level in blood reflects the average ZPP production over the previous 3-4 months and consequently the average lead exposure during that time interval.

It is recommended that a hematocrit be determined whenever a confirmed ZPP of 50 $\mu\text{g}/100\text{ ml}$ whole blood is obtained to rule out a significant underlying anemia. If the ZPP is in excess of 100 $\mu\text{g}/100\text{ ml}$ and not associated with abnormal elevations in blood lead levels, the laboratory should be checked to be sure that blood leads were determined using atomic absorption spectrophotometry anodic stripping voltammetry, or any method which meets the accuracy requirements set forth by the standard by an OSHA approved laboratory which is experienced in lead level determinations. Repeat periodic blood lead studies should be obtained in all individuals with elevated ZPP levels to be certain that an associated elevated blood lead level has not been missed due to transient fluctuations in blood leads.

ZPP has a characteristic fluorescence spectrum with a peak at 594 nm which is detectable with a hematofluorimeter. The hematofluorimeter is accurate and portable and can provide on-site, instantaneous results for workers who can be frequently tested via a finger prick.

Careful attention must be given to calibration and quality control procedures. Limited data on blood lead-ZPP correlations and the ZPP levels which are associated with the

adverse health effects discussed in subsection (3) are the major limitations of the test. Also it is difficult to correlate ZPP levels with environmental exposure and there is some variation of response with age and sex. Nevertheless, the ZPP promises to be an important diagnostic test for the early detection of lead toxicity and its value will increase as more data is collected regarding its relationship to other manifestations of lead poisoning.

Levels of delta-aminolevulinic acid (ALA) in the urine are also used as a measure of lead exposure. Increasing concentrations of ALA are believed to result from the inhibition of the enzyme delta-aminolevulinic acid dehydrase (ALA-D). Although the test is relatively easy to perform, inexpensive, and rapid, the disadvantages include variability in results, the necessity to collect a complete 24 hour urine sample which has a specific gravity greater than 1.010, and also the fact that ALA decomposes in the presence of light.

The pattern of porphyrin excretion in the urine can also be helpful in identifying lead intoxication. With lead poisoning, the urine concentrations of coproporphyrins I and II, porphobilinogen and uroporphyrin I rise. The most important increase, however, is that of coproporphyrin III; levels may exceed 5,000 $\mu\text{g}/\text{l}$ in the urine in lead poisoned individuals, but its correlation with blood lead levels and ZPP are not as good as those of ALA. Increases in urinary porphyrins are not diagnostic of lead toxicity and may be seen in porphyria, some liver diseases, and in patients with high reticulocyte counts.

Summary. The Washington Industrial Safety and Health Act's standard for inorganic lead in the construction industry places significant emphasis on the medical surveillance of all workers exposed to levels of inorganic lead above 30 $\mu\text{g}/\text{m}^3$ TWA. The physician has a fundamental role in this surveillance program, and in the operation of the medical removal protection program.

Even with adequate worker education on the adverse health effects of lead and appropriate training in work practices, personal hygiene and other control measures, the physician has a primary responsibility for evaluating potential lead toxicity in the worker. It is only through a careful and detailed medical and work history, a complete physical examination and appropriate laboratory testing that an accurate assessment can be made. Many of the adverse health effects of lead toxicity are either irreversible or only partially reversible and therefore early detection of disease is very important.

This document outlines the medical monitoring program as defined by the occupational safety and health standard for inorganic lead. It reviews the adverse health effects of lead poisoning and describes the important elements of the history and physical examinations as they relate to these adverse effects. Finally, the appropriate laboratory testing for evaluating lead exposure and toxicity is presented.

It is hoped that this review and discussion will give the physician a better understanding of the WISHA standard with the ultimate goal of protecting the health and well-being of the worker exposed to lead under their care.

[Statutory Authority: Chapter 49.17 RCW, 93-22-054 (Order 93-07), § 296-155-17654, filed 10/29/93, effective 12/10/93.]

WAC 296-155-17656 Appendix D to WAC 296-155-176—Qualitative and quantitative fit test protocols. Fit test protocols.

(1) Definitions.

(a) Quantitative fit test. The test is performed in a test chamber. The normal air-purifying element of the respirator is replaced by a high-efficiency particulate air (HEPA) filter in the case of particulate QNFT aerosols or a sorbent offering contaminant penetration protection equivalent to high-efficiency filters where the QNFT test agent is a gas or vapor.

(b) Challenge agent means the aerosol, gas or vapor introduced into a test chamber so that its concentration inside and outside the respirator may be measured.

(c) Test subject means the person wearing the respirator for quantitative fit testing.

(d) Normal standing position means standing erect and straight with arms down along the sides and looking straight ahead.

(e) Maximum peak penetration method means the method of determining test agent penetration in the respirator as determined by strip chart recordings of the test. The highest peak penetration for a given exercise is taken to be representative of average penetration into the respirator for that exercise.

(f) Average peak penetration method means the method of determining test agent penetration into the respirator utilizing a strip chart recorder, integrator, or computer. The agent penetration is determined by an average of the peak heights on the graph or by computer integration, for each exercise except the grimace exercise. Integrators or computers which calculate the actual test agent penetration into the respirator for each exercise will also be considered to meet the requirements of the average peak penetration method.

(g) "Fit factor" means the ration of challenge agent concentration outside with respect to the inside of a respirator inlet covering (facepiece or enclosure).

(2) General: The employer shall include the following provisions in the fit test procedures. These provisions apply to both qualitative fit testing (QLFT) and quantitative fit testing (QNFT) permissible for compliance with WAC 296-155-17613 (3)(b). All testing shall be conducted annually.

(a) The test subject shall be allowed to pick the most comfortable respirator from a selection including respirators of various sizes from different manufacturers. The selection shall include at least three sizes of elastomeric facepieces of the type of respirator that is to be tested, i.e., three sizes of half mask; or three sizes of full facepiece. Respirators of each size must be provided from at least two manufacturers.

(b) Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine a comfortable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning the respirator. This instruction may not constitute the subject's formal training on respirator use, as it is only a review.

(c) The test subject shall be informed they are being asked to select the respirator which provides the most comfortable fit. Each respirator represents a different size and shape, and if fitted, maintained and used properly, will provide adequate protection.

(d) The test subject shall be instructed to hold each facepiece up to the face and eliminate those which obviously do not give a comfortable fit.

(e) The more comfortable facepieces are noted; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in item 6 below. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

(f) Assessment of comfort shall include reviewing the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:

- (i) Position of the mask on the nose;
- (ii) Room for eye protection;
- (iii) Room to talk; and
- (iv) Position of mask on face and cheeks.

(g) The following criteria shall be used to help determine the adequacy of the respirator fit:

- (i) Chin properly placed;
- (ii) Adequate strap tension, not overly tightened;
- (iii) Fit across nose bridge;
- (iv) Respirator of proper size to span distance from nose to chin;
- (v) Tendency of respirator to slip; and
- (vi) Self-observation in mirror to evaluate fit and respirator position.

(h) The test subject shall conduct the negative and positive pressure fit checks as described below or in ANSI Z88.2-1980. Before conducting the negative or positive pressure test, the subject shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another facepiece shall be selected and retested if the test subject fails the fit check tests.

(i) Positive pressure check. Close off the exhalation valve and exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

(ii) Negative pressure check. Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

(i) The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, or long sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

(j) If a test subject exhibits difficulty in breathing during the tests, they shall be referred to a physician to determine

whether the test subject can wear a respirator while performing their duties.

(k) If at any time within the first two week of use the respirator becomes uncomfortable, the test subject shall be given the opportunity to select a different facepiece and to be retested.

(l) The employer shall maintain a record of the fit test administered to an employee. The record shall contain at least the following information:

- (i) Name of employee;
- (ii) Type of respirator;
- (iii) Brand, size of respirator;
- (iv) Date of test;

(v) Where QNFT is used: The fit factor, strip chart recording or other recording of the results of the test. The record shall be maintained until the next fit test is administered.

(m) Exercise regimen. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.

(n) Test exercises. The test subject shall perform exercises, in the test environment, in the manner described below:

(i) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally.

(ii) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as to not hyperventilate.

(iii) Turning head side to side. Standing in place, the subject shall slowly turn their head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.

(iv) Moving head up and down. Standing in place, the subject shall slowly move their head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).

(v) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage (see below), count backward from 100, or recite a memorized poem or song.

Rainbow passage.

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(vi) Grimace. The test subject shall grimace by smiling or frowning.

(vii) Bending over. The test subject shall bend at the waist as if they were to touch their toes. Jogging in place shall be substituted for this exercise in those test environments

such as shroud type QNFT units which prohibit bending at the waist.

(viii) Normal breathing. Same as exercise 1. Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become uncomfortable, another model of respirator shall be tried.

(3) Qualitative fit test (QLFT) protocols.

(a) General.

(i) The employer shall assign specific individuals who shall assume full responsibility for implementing the respirator qualitative fit test program.

(ii) The employer shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and assure that test equipment is in proper working order.

(iii) The employer shall assure that QLFT equipment is kept clean and well maintained so as to operate at the parameters for which it was designed.

(b) Isoamyl acetate protocol.

(i) Odor threshold screening. The odor threshold screening test, performed without wearing a respirator, is intended to determine if the individual tested can detect the odor of isoamyl acetate.

(A) Three 1 liter glass jars with metal lids are required.

(B) Odor free water (e.g., distilled or spring water) at approximately 25 degrees C shall be used for the solutions.

(C) The isoamyl acetate (IAA) (also known as isopentyl acetate) stock solution is prepared by adding 1 cc of pure IAA to 800 cc of odor free water in a 1 liter jar and shaking for 30 seconds. A new solution shall be prepared at least weekly.

(D) The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well ventilated but shall not be connected to the same recirculating ventilation system.

(E) The odor test solution is prepared in a second jar by placing 0.4 cc of the stock solution into 500 cc of odor free water using a clean dropper or pipette. The solution shall be shaken for 30 seconds and allowed to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution shall be used for only one day.

(F) A test blank shall be prepared in a third jar by adding 500 cc of odor free water.

(G) The odor test and test blank jars shall be labeled 1 and 2 for jar identification. Labels shall be placed on the lids so they can be periodically peeled, dried off and switched to maintain the integrity of the test.

(H) The testing instruction shall be typed on a card and placed on the table in front of the two test jars (i.e., 1 and 2): "The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."

(I) The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.

(J) If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test shall not be performed.

(K) If the test subject correctly identifies the jar containing the odor test solution, the test subject may proceed to respirator selection and fit testing.

(ii) Isoamyl acetate fit test.

(A) The fit test chamber shall be similar to a clear 55-gallon drum liner suspended inverted over a 2-foot diameter frame so that the top of the chamber is about 6 inches above the test subject's head. The inside top center of the chamber shall have a small hook attached.

(B) Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors. The cartridges or masks shall be changed at least weekly.

(C) After selecting, donning, and properly adjusting a respirator, the test subject shall wear it to the fit testing room. This room shall be separate from the room used for odor threshold screening and respirator selection, and shall be well ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.

(D) A copy of the test exercises and any prepared text from which the subject is to read shall be taped to the inside of the test chamber.

(E) Upon entering the test chamber, the test subject shall be given a 6-inch by 5-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half and wetted with 0.75 cc of pure IAA. The test subject shall hang the wet towel on the hook at the top of the chamber.

(F) Allow two minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the test subject; to explain the fit test, the importance of their cooperation, and the purpose for the head exercises; or to demonstrate some of the exercises.

(G) If at any time during the test, the subject detects the banana like odor of IAA, the test has failed. The subject shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.

(H) If the test has failed, the subject shall return to the selection room and remove the respirator, repeat the odor sensitivity test, select and put on another respirator, return to the test chamber and again begin the procedure described in subitems (A) through (G) of this item. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject shall wait about 5 minutes before retesting. Odor sensitivity will usually have returned by this time.

(I) When a respirator is found that passes the test, its efficiency shall be demonstrated for the subject by having the subject break the face seal and take a breath before exiting the chamber.

(J) When the test subject leaves the chamber, the subject shall remove the saturated towel and return it to the person conducting the test. To keep the test area from becoming contaminated, the used towels shall be kept in a self sealing bag

so there is no significant IAA concentration build-up in the test chamber during subsequent tests.

(c) Saccharin solution aerosol protocol. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(i) Taste threshold screening. The saccharin taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of saccharin.

(A) During threshold screening as well as during fit testing, subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches in diameter by 14 inches tall with at least the front portion clear and that allows free movements of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts (R) FT 14 and (R) FT 15 combined, is adequate.

(B) The test enclosure shall have a 3/4 inch hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(C) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through their wide open mouth with tongue extended.

(D) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer the test conductor shall spray the threshold check solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(E) The threshold check solution consists of 0.83 grams of sodium saccharin USP in 100 cc of warm water. It can be prepared by putting 1 cc of the fit test solution (see (ii)(E) below) in 100 cc of distilled water.

(F) To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then released and allowed to fully expand.

(G) Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted.

(H) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted.

(I) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted.

(J) The test conductor will take note of the number of squeezes required to solicit a taste response.

(K) If the saccharin is not tasted after 30 squeezes (step 10), the test subject may not perform the saccharin fit test.

(L) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

(M) Correct use of the nebulizer means that approximately 1 cc of liquid is used at a time in the nebulizer body.

(N) The nebulizer shall be thoroughly rinsed in water, shaken dry, and refilled at least each morning and afternoon or at least every four hours.

(ii) Saccharin solution aerosol fit test procedure.

(A) The test subject may not eat, drink (except plain water), or chew gum for 15 minutes before the test.

(B) The fit test uses the same enclosure described in subdivision (c)(i) of this subsection.

(C) The test subject shall don the enclosure while wearing the respirator selected in subdivision (c)(i) of this subsection.

tion. The respirator shall be properly adjusted and equipped with a particulate filter(s).

(D) A second DeVilbiss Model 40 Inhalation Medication Nebulizer is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(E) The fit test solution is prepared by adding 83 grams of sodium saccharin to 100 cc of warm water.

(F) As before, the test subject shall breathe through the wide open mouth with tongue extended.

(G) The nebulizer is inserted into the hole in the front of the enclosure and the fit test solution is sprayed into the enclosure using the same number of squeezes required to elicit a taste response in the screening test.

(H) After generating the aerosol the test subject shall be instructed to perform the exercises in subsection (2)(n) of this section.

(I) Every 30 seconds the aerosol concentration shall be replenished using one half the number of squeezes as initially.

(J) The test subject shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected.

(K) If the taste of saccharin is detected, the fit is deemed unsatisfactory and a different respirator shall be tried.

(L) Successful completion of the test protocol shall allow the use of the tested respirator in contaminated atmospheres up to 10 times the PEL. In other words, this protocol may be used for assigned protection factors no higher than 10.

(d) Irritant fume protocol.

(i) The respirator to be tested shall be equipped with high-efficiency particulate air (HEPA) filters.

(ii) The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its characteristic odor.

(iii) Break both ends of a ventilation smoke tube containing stannic oxychloride, such as the MSA part No. 5645, or equivalent. Attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute.

(iv) Advise the test subject that the smoke can be irritating to the eyes and instruct the subject to keep their eyes closed while the test is performed.

(v) The test conductor shall direct the stream of irritant smoke from the smoke tube towards the face seal area of the test subject. They shall begin at least 12 inches from the facepiece and gradually move to within one inch, moving around the whole perimeter of the mask.

(vi) The exercises identified in subsection (2)(n) of this section above shall be performed by the test subject while the respirator seal is being challenged by the smoke.

(vii) Each test subject passing the smoke test without evidence of a response shall be given a sensitivity check of the smoke from the same tube once the respirator has been removed to determine whether their reactions to the smoke. Failure to evoke a response shall void the fit test.

(viii) The fit test shall be performed in a location with exhaust ventilation sufficient to prevent general contamination of the testing area by the test agent.

(4) Quantitative fit test (QNFT) protocol.

(a) General.

(i) The employer shall assign specific individuals who shall assume full responsibility for implementing the respirator quantitative fit test program.

(ii) The employer shall ensure that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly and assure that test equipment is in proper working order.

(iii) The employer shall assure that QNFT equipment is kept clean and well maintained so as to operate at the parameters for which it was designed.

(b) Apparatus.

(i) Instrumentation. Aerosol generation, dilution, and measurement systems using corn oil or sodium chloride as test aerosols shall be used for quantitative fit testing.

(ii) Test chamber. The test chamber shall be large enough to permit all test subjects to perform freely all required exercises without disturbing the challenge agent concentration or the measurement apparatus. The test chamber shall be equipped and constructed so that the challenge agent is effectively isolated from the ambient air, yet uniform in concentration throughout the chamber.

(iii) When testing air-purifying respirators, the normal filter or cartridge element shall be replaced with a high-efficiency particulate filter supplied by the same manufacturer.

(iv) The sampling instrument shall be selected so that a strip chart record may be made of the test showing the rise and fall of the challenge agent concentration with each inspiration and expiration at fit factors of at least 2,000. Integrators or computers which integrate the amount of test agent penetration leakage into the respirator for each exercise may be used provided a record of the readings is made.

(v) The combination of substitute air-purifying elements, challenge agent and challenge agent concentration in the test chamber shall be such that the test subject is not exposed in excess of an established exposure limit for the challenge agent at any time during the testing process.

(vi) The sampling port on the test specimen respirator shall be placed and constructed so that no leakage occurs around the port (e.g., where the respirator is probed), a free air flow is allowed into the sampling line at all times and so that there is no interference with the fit or performance of the respirator.

(vii) The test chamber and test set up shall permit the person administering the test to observe the test subject inside the chamber during the test.

(viii) The equipment generating the challenge atmosphere shall maintain the concentration of challenge agent inside the test chamber constant to within a 10 percent variation for the duration of the test.

(ix) The time lag (interval between an event and the recording of the event on the strip chart or computer or integrator) shall be kept to a minimum. There shall be a clear association between the occurrence of an event inside the test chamber and its being recorded.

(x) The sampling line tubing for the test chamber atmosphere and for the respirator sampling port shall be of equal diameter and of the same material. The length of the two lines shall be equal.

(xi) The exhaust flow from the test chamber shall pass through a high-efficiency filter before release.

(xii) When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed 50 percent.

(xiii) The limitations of instrument detection shall be taken into account when determining the fit factor.

(xiv) Test respirators shall be maintained in proper working order and inspected for deficiencies such as cracks, missing valves and gaskets, etc.

(c) Procedural requirements.

(i) When performing the initial positive or negative pressure test the sampling line shall be crimped closed in order to avoid air pressure leakage during either of these tests.

(ii) An abbreviated screening isoamyl acetate test or irritant fume test may be utilized in order to quickly identify poor fitting respirators which passed the positive and/or negative pressure test and thus reduce the amount of QNFT time. When performing a screening isoamyl acetate test, combination high-efficiency organic vapor cartridges/canisters shall be used.

(iii) A reasonably stable challenge agent concentration shall be measured in the test chamber prior to testing. For canopy or shower curtain type of test units the determination of the challenge agent stability may be established after the test subject has entered the test environment.

(iv) Immediately after the subject enters the test chamber, the challenge agent concentration inside the respirator shall be measured to ensure that the peak penetration does not exceed 5 percent for a half mask or 1 percent for a full facepiece respirator.

(v) A stable challenge concentration shall be obtained prior to the actual start of testing.

(vi) Respirator restraining straps shall not be overtightened for testing. The straps shall be adjusted by the wearer without assistance from other persons to give a reasonable comfortable fit typical of normal use.

(vii) The test shall be terminated whenever any single peak penetration exceeds 5 percent for half masks and 1 percent for full facepiece respirators. The test subject shall be refitted and retested. If two of the three required tests are terminated, the fit shall be deemed inadequate.

(viii) In order to successfully complete a QNFT, three successful fit tests are required. The results of each of the three independent fit tests must exceed the minimum fit factor needed for the class of respirator (e.g., half mask respirator, full facepiece respirator).

(ix) Calculation of fit factors.

(A) The fit factor shall be determined for the quantitative fit test by taking the ratio of the average chamber concentration to the concentration inside the respirator.

(B) The average test chamber concentration is the arithmetic average of the test chamber concentration at the beginning and of the end of the test.

(C) The concentration of the challenge agent inside the respirator shall be determined by one of the following methods:

(I) Average peak concentration.

(II) Maximum peak concentration.

(III) Integration by calculation of the area under the individual peak for each exercise. This includes computerized integration.

(x) Interpretation of test results. The fit factor established by the quantitative fit testing shall be the lowest of the three fit factor values calculated from the three required fit tests.

(xi) The test subject shall not be permitted to wear a half mask, or full facepiece respirator unless a minimum fit factor equivalent to at least 10 times the hazardous exposure level is obtained.

(xii) Filters used for quantitative fit testing shall be replaced at least weekly, or whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media. Organic vapor cartridges/canisters shall be replaced daily (when used) or sooner if there is any indication of breakthrough by a test agent.

[Statutory Authority: Chapter 49.17 RCW. 93-22-054 (Order 93-07), § 296-155-17656, filed 10/29/93, effective 12/10/93.]

PART B-2 HAZARD COMMUNICATION

WAC 296-155-180 Hazard communication. General.

The employer shall develop and maintain a hazard communication program as required by chapter 296-62 WAC, Part C, which will provide information to all employees relative to hazardous chemicals or substances to which they are exposed, or may become exposed, in the course of their employment.

[Statutory Authority: Chapter 49.17 RCW. 94-16-145, § 296-155-180, filed 8/3/94, effective 9/12/94; 89-11-035 (Order 89-03), § 296-155-180, filed 5/15/89, effective 6/30/89.]

PART C PERSONAL PROTECTIVE AND LIFE SAVING EQUIPMENT

WAC 296-155-200 General requirements. (1) Application.

(a) Protective equipment, including personal protective equipment for eyes, face, head, hearing, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

(b) Employee owned equipment. Where employees provide their own protective equipment, the employer shall be responsible to assure its adequacy, including proper maintenance and sanitation of such equipment.

(c) Design. All personal protective equipment shall be of safe design and construction for the work to be performed.

(2) Construction personnel shall comply with plant or job safety practices and procedures, peculiar to particular industries and plants, relating to protective equipment and procedures when engaged in construction work in such plants or job sites.

(3) The employer is responsible for requiring the wearing of appropriate personal protective equipment in all operations where there is an exposure to hazardous conditions or

where this part indicates a need for using such equipment to reduce the hazards to the employees.

(4) Where there is a danger of contact with moving parts of machinery, or the work process is such that a hazard exists:

(a) The clothing of employees shall fit closely about the body.

(b) Dangling neck wear, bracelets, wristwatches, rings, or similar articles shall not be worn by employees.

(5) Employees, whose duties are performed in areas and under circumstances where they are exposed to the danger of moving vehicles, shall wear work vests of highly visible materials, or equivalent distinguishing apparel.

(6) Employers shall ensure that employees wear no less than a short sleeved shirt, long pants, and shoes. Employees shall wear no less than a short sleeved shirt, long pants, and shoes. Shoes shall meet the requirements of WAC 296-155-212.

Note: For additional personal protective and life saving equipment requirements, refer to the general safety and health standards, WAC 296-24-075 through 296-24-092.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-200, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-200, filed 1/21/86; Order 76-29, § 296-155-200, filed 9/30/76; Order 74-26, § 296-155-200, filed 5/7/74, effective 6/6/74.]

WAC 296-155-201 Definitions applicable to this chapter. (1) "Catenary life line" means a horizontal rope between two fixed anchorages, independent of the work surface, to which the lanyard is attached, either by tying or by means of a sliding connection. A catenary life line shall be capable of supporting a minimum dead weight of 5,400 pounds per person, applied at the midpoint of the line.

(2) "Contaminant" means any material which by reason of its action upon, within, or to a person or object is likely to cause physical harm.

(3) "Dropline" means a vertical rope from a fixed anchorage, independent of the work surface, to which the lanyard is affixed or tied.

(4) "Fixed anchorage" means a secure point of attachment, not a part of the work surface, for droplines, lifelines, catenary life lines, or lanyards. The fixed anchorage and its appurtenances shall be capable of supporting a minimum dead weight of 5,400 pounds per worker.

(5) "Lanyard" means a rope, suitable for supporting one person. One end is fastened to a safety belt or harness and the other end is secured to a substantial object or a safety line.

(6) "Lifeline" means a rope, suitable for supporting one person, to which a lanyard or safety belt (or harness) is attached.

(7) "O.D." means optical density and refers to the light refractive characteristics of a lens.

(8) "Radiant energy" means energy that travels outward in all directions from its source.

(9) "Safety belt" means a device, usually worn around the waist which, by reason of its attachment to a lanyard and lifeline or a structure, will prevent a worker from falling.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-201, filed 1/21/86; Order 76-6, § 296-155-201, filed 3/1/76.]

(1999 Ed.)

WAC 296-155-203 Confined spaces. All work conducted in a confined space shall comply with the provisions of chapter 296-62 WAC Part M, and the following sections.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-203, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-203, filed 1/21/86.]

WAC 296-155-20301 Definitions. Confined space means a space that:

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

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

(3) Is not designed for continuous employee occupancy.

"Corrosives" means substances which in contact with living tissue cause destruction of the tissue by chemical action.

"Hazardous atmosphere" means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

(1) Flammable gas, vapor, or mist in excess of ten percent of its lower flammable limit (LFL);

(2) Airborne combustible dust at a concentration that meets or exceeds its LFL;

Note: This concentration may be approximated as a condition in which the dust obscures vision at a distance of five feet (1.52m) or less.

(3) Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;

(4) Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in chapter 296-62 WAC, general occupational health standards, and which could result in employee exposure in excess of its dose or permissible exposure limit;

Note: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

(5) Any other atmospheric condition that is immediately dangerous to life or health.

Note: For air contaminants for which WISHA has not determined a dose or permissible exposure limit, other sources of information, such as material safety data sheets that comply with the Hazard Communication Standard, chapter 296-62 WAC, Part C, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

"Irritants" means substances which on immediate, prolonged, or repeated contact with normal living tissue will induce a local inflammatory reaction.

"Oxygen deficient atmospheres" means atmospheres at sea level having less than 19.5% oxygen by volume or having a partial pressure of 148 millimeters of mercury or less. This may deviate when working at higher altitudes and should be determined for an individual location. Factors such as acclimatization, physical condition of persons involved,

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etc., must be considered for such circumstances and conditions. (See chapter 296-62 WAC, Part M, permit-required confined spaces.)

"**Toxicants**" means substances which have the inherent capacity to produce personal injury or illness to persons by absorption through any body surface.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060, 95-17-036, § 296-155-20301, filed 8/9/95, effective 9/25/95. Statutory Authority: Chapter 49.17 RCW, 95-04-007, § 296-155-20301, filed 1/18/95, effective 3/1/95; 91-24-017 (Order 91-07), § 296-155-20301, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-20301, filed 1/21/86.]

WAC 296-155-20307 Confined space work on sewer systems under construction. New systems under construction or new installations which have not yet been connected to a used system, may substitute forced ventilation for the testing requirements of chapter 296-62 WAC Part M provided:

(1) Ventilation is effectively provided at least five minutes prior to entry into the confined space;

(2) Ventilation is provided, as required by WAC 296-62-110, et seq., which supplies a continuous flow of air;

(3) Ventilation exhaust is discharged so as to present no hazard to other employees;

(4) An attendant is provided at the surface when there are employees in the manhole or pipe. The attendant shall not leave the manhole unattended until such time as all employees are out and the cover has been replaced; and

(5) All other requirements for confined spaces are observed. See chapter 296-62 WAC Part M.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-20307, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-20307, filed 1/21/86.]

WAC 296-155-205 Head protection. (1) All employees on any construction site shall be provided an individual hard hat which meets all requirements of (a) and (b) of this subsection. Employers shall provide individual hard hats at no cost to the employees.

(a) Hard hats for the protection of employees against impact and/or penetration of falling and flying objects shall meet the specifications contained in American National Standards Institute, Z89.1-1969, Safety Requirements for Industrial Head Protection.

(b) Hard hats for the head protection of employees exposed to high voltage electrical shock and burns shall meet the specifications contained in American National Standards Institute, Z89.2-1971.

(2) All employees must have their individual hard hats on site and readily available at all times.

(3) All employees shall wear a hard hat on any construction site whenever there is a potential exposure to danger of flying or falling objects to persons working or occupying the area.

Note: The hard hat may be removed whenever there is no potential exposure to a hazard.

(4) Employees working on asphalt paving crews when they are exposed to extreme temperatures from hot mix and when they are not exposed to falling objects need not wear

protective hard hats. Flaggers working in conjunction with asphalt paving operations shall wear protective hard hats.

(5) Caps with metal buttons or metal visors shall not be worn around electrical hazards.

(6) Employees working near moving machinery or in locations which present a hair-catching or fire hazard shall wear caps, nets or other head and face protection that will completely contain the hair.

[Statutory Authority: Chapter 49.17 RCW, 91-11-070 (Order 91-01), § 296-155-205, filed 5/20/91, effective 6/20/91; 89-11-035 (Order 89-03), § 296-155-205, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-205, filed 1/21/86; Order 74-26, § 296-155-205, filed 5/7/74, effective 6/6/74.]

WAC 296-155-210 Hearing protection. The hearing protection requirements of the general occupational health standards, chapter 296-62 WAC, shall apply.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-155-210, filed 11/30/83; Order 74-26, § 296-155-210, filed 5/7/74, effective 6/6/74.]

WAC 296-155-211 Leg protection. Employees whose duties require them to operate a power chain saw shall wear flexible ballistic nylon pads, sewn or otherwise fastened into the trousers, or other equivalent protection that will protect the vulnerable areas of the legs.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-211, filed 1/21/86.]

WAC 296-155-212 Foot protection. (1) Substantial footwear, made of leather or other equally firm material, shall be worn by employees in any occupation in which there is a danger of injury to the feet through falling or moving objects, or from burning, scalding, cutting, penetration, or like hazard.

(a) The soles and heels of such footwear shall be of a material that will not create a slipping hazard.

(b) Shoes made of leather or other firm materials that have soft athletic-type soles which would protect employees from foot injuries and at the same time, provide soft and firm footing while working under specialty requirements or with specialty materials are acceptable if meeting safety shoe requirements established by OSHA or ANSI.

(c) Footwear that has deteriorated to a point where it does not provide the required protection shall not be used.

(2) Calks or other suitable footwear, which will afford reasonable protection from slipping, shall be worn while working on logs, poles, pilings, or similar forest products.

(3) Traditional tennis shoes, shoes with canvas tops, or thin or soft soled athletic shoes, open toed sandals, slippers, dress shoes or other similar type shoes shall not be worn. Soft or athletic-type soles with uppers of leather or other substantial material may be used where firm footing is desired and where minimal danger of injury to feet from falling or moving objects.

(4) Safety-toe footwear for employees shall meet the requirements and specifications in American National Standard for Men's Safety-Toe Footwear, Z41.1-1967.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-212, filed 7/20/94, effective 9/20/94; 89-11-035 (Order 89-03), § 296-155-212, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-212, filed 1/21/86; Order 74-26, § 296-155-212, filed 5/7/74, effective 6/6/74.]

WAC 296-155-215 Eye and face protection. (1) General.

(a) Employees shall use eye and face protection equipment when machines or operations present potential eye or face injury from physical, chemical, or radiation agents.

(b) Eye and face protection equipment required by this part shall meet the requirements specified in American National Standards Institute, Z87.1-1968, Practice for Occupational and Educational Eye and Face Protection.

(c) Employees whose vision requires the use of corrective lenses in spectacles, when required by this regulation to wear eye protection, shall be protected by goggles or spectacles of one of the following types:

(i) Spectacles whose protective lenses provide optical correction;

(ii) Goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles.

(iii) Goggles that incorporate corrective lenses mounted behind the protective lenses.

(d) Face and eye protection equipment shall be kept clean and in good repair. The use of this type equipment with structural or optical defects shall be prohibited.

(e) Table C-1 shall be used as a guide in the selection of face and eye protection for the hazards and operations noted.

(f) Protectors shall meet the following minimum requirements:

(i) They shall provide adequate protection against the particular hazards for which they are designed.

(ii) They shall be reasonably comfortable when worn under the designated conditions.

(iii) They shall fit snugly and shall not unduly interfere with the movements of the wearer.

(iv) They shall be durable.

(v) They shall be capable of being disinfected.

(vi) They shall be easily cleanable.

(g) Every protector shall be distinctly marked to facilitate identification only of the manufacturer.

(h) When limitations or precautions are indicated by the manufacturer, they shall be transmitted to the user and care taken to see that such limitations and precautions are strictly observed.

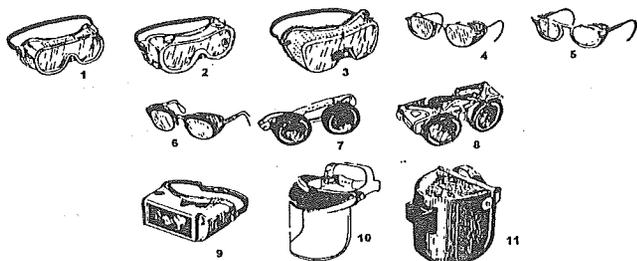


TABLE C-1

EYE AND FACE PROTECTION SELECTION GUIDE

1. GOGGLES, flexible fitting, regular ventilation
2. GOGGLES, flexible fitting, hooded ventilation
3. GOGGLES, cushioned fitting, rigid body
- *4. SPECTACLES, metal frame, with sideshields
- *5. SPECTACLES, plastic frame with sideshields
- *6. SPECTACLES, metal-plastic frame, with sideshields
- **7. WELDING GOGGLES, eyecup type, tinted lenses (illustrated)
- 7A. CHIPPING GOGGLES, eyecup type, clear safety lenses (not illustrated)

TABLE C-1

EYE AND FACE PROTECTION SELECTION GUIDE

- **8. WELDING GOGGLES, coverspec type tinted lenses (illustrated)
- 8A. CHIPPING GOGGLES, coverspec type, clear safety lenses (not illustrated)
- **9. WELDING GOGGLES, coverspec type, tinted plate lens
- 10. FACE SHIELD (available with plastic or mesh window)
- 11. WELDING HELMETS

* Nonside shield spectacles are available for limited hazard use requiring only frontal protection.

** See Table C-2 in (2) of this section, Filter lens shade numbers for protection against radiant energy.

APPLICATIONS		
OPERATION	HAZARDS	RECOMMENDED PROTECTORS: Underscored Numbers Signify Preferred Protection
ACETYLENE-BURNING ACETYLENE-CUTTING ACETYLENE-WELDING	SPARKS, HARMFUL RAYS, MOLTEN METAL, FLYING PARTICLES	<u>7</u> , <u>8</u> , <u>9</u>
CHEMICAL HANDLING	SPLASH, ACID BURNS, FUMES	<u>2</u> , <u>10</u> (for severe exposure add <u>10</u> over 2)
CHIPPING	FLYING PARTICLES	<u>1</u> , <u>3</u> , <u>4</u> , <u>5</u> , <u>6</u> , <u>7A</u> , <u>8A</u>
ELECTRIC (ARC) WELDING	SPARKS, INTENSE RAYS, MOLTEN METAL	<u>9</u> , <u>11</u> (<u>11</u> in combination with 4, 5, 6, in tinted lenses, advisable)
FURNACE OPERATIONS	GLARE, HEAT, MOLTEN METAL	<u>7</u> , <u>8</u> , <u>9</u> (for severe exposure add <u>10</u>)
GRINDING-LIGHT	FLYING PARTICLES	<u>1</u> , <u>3</u> , <u>4</u> , <u>5</u> , <u>6</u> , <u>10</u>
GRINDING-HEAVY	FLYING PARTICLES	<u>1</u> , <u>3</u> , <u>7A</u> , <u>8A</u> (for severe exposure add 10)
LABORATORY	CHEMICAL SPLASH, GLASS BREAKAGE	<u>2</u> (10 when in combination with <u>4</u> , <u>5</u> , <u>6</u>)
MACHINING	FLYING PARTICLES	<u>1</u> , <u>3</u> , <u>4</u> , <u>5</u> , <u>6</u> , <u>10</u>
MOLTEN METALS	HEAT, GLARE, SPARKS, SPLASH	<u>7</u> , <u>8</u> (<u>10</u> in combination with <u>4</u> , <u>5</u> , <u>6</u> , in tinted lenses)
SPOT WELDING	FLYING PARTICLES, SPARKS	<u>1</u> , <u>3</u> , <u>4</u> , <u>5</u> , <u>6</u> , <u>10</u>

(2) Protection against radiant energy. (a) Selection of shade numbers for welding filter. Table C-2 shall be used as a guide for the selection of the proper shade numbers of filter lenses or plates used in welding. Shades more dense than those listed may be used to suit the individual's needs.

TABLE C-2

FILTER LENS SHADE NUMBERS FOR PROTECTION AGAINST RADIANT ENERGY

Welding Operation	Shade number
Shielded metal-arc welding 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes	10
Gas-shielded arc welding (nonferrous) 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes	11
Gas-shielded arc welding (ferrous) 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes	12

TABLE C-2

FILTER LENS SHADE NUMBERS FOR PROTECTION AGAINST RADIANT ENERGY

Welding Operation	Shade number
Shielded metal-arc welding 3/16-, 7/32-, 1/4-inch diameter electrodes	12
5/16-, 3/8-inch diameter electrodes	14
Atomic hydrogen welding	10-14
Carbon-arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1 inch to 6 inches	4 or 5
Heavy cutting, over 6 inches	5 or 6
Gas welding (light), up to 1/8-inch	4 or 5
Gas welding (medium), 1/8-inch to 1/2-inch	5 or 6
Gas welding (heavy), over 1/2-inch	6 or 9

(b) Laser protection.

(i) Employees whose occupation or assignment requires potentially hazardous exposure (see WAC 296-62-09005(4)) to laser radiation shall wear suitable laser safety goggles which will protect for the specific wavelength of the laser and be of optical density (O.D.) adequate for the energy involved. Table C-3 lists the maximum power or energy density for which adequate protection is afforded by glasses of optical densities from 5 through 8.

TABLE C-3

SELECTING LASER SAFETY GLASS

INTENSITY CW maximum power density (watts/cm ²)	ATTENUATION	
	Optical density (O.D.)	Attenuation factor
10 ⁻²	5	10 ⁵
10 ⁻¹	6	10 ⁶
1.0	7	10 ⁷
10.0	8	10 ⁸

Output levels falling between lines in this table shall require the higher optical density.

(ii) All protective goggles shall bear a label identifying the following data:

- (a) The laser wavelengths for which use is intended;
- (b) The optical density of those wavelengths.
- (c) The visible light transmission.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-215, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 85-01-022 (Order 84-24), § 296-155-215, filed 12/11/84; Order 74-26, § 296-155-215, filed 5/7/74, effective 6/6/74.]

WAC 296-155-220 Respiratory protection. General. In emergencies, or when controls required by Part B of this chapter either fail or are inadequate to prevent harmful exposure to employees, appropriate respiratory protective devices shall be provided by the employer and shall be used in accordance with WAC 296-62-071.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 83-15-017 (Order 83-19), § 296-155-220, filed 7/13/83, effective 9/12/83; Order 74-26, § 296-155-220, filed 5/7/74, effective 6/6/74.]

WAC 296-155-235 Working over or adjacent to water. (1) When an employee is employed under conditions

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which expose them to a risk of drowning, they shall wear a U.S. Coast Guard approved life saving device, unless it can be shown that conditions, such as shallow water, are such that flotation would not be achieved.

(2) Prior to and after each use, the buoyant life saving device shall be inspected for defects which would alter their strength or buoyancy. Defective units shall not be used.

(3) Ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.

(4) At least one lifesaving skiff shall be immediately available at locations where employees are working over or adjacent to water. Each skiff, or skiffs, shall:

(a) Be suitable for conditions where used.

(b) Be equipped with oar locks securely attached to gunwales, oars, one boat hook, and one cork ring buoy with fifty feet of suitable line attached.

(5) Whenever boats or skiffs cannot be used, due to swift currents, life lines close to the water surface shall be provided and, wherever practicable, a line shall be stretched across the stream with tag lines.

(6) Where workers are transported by boat or barge, only such number of persons shall be carried that can be safely accommodated on fixed seats. Capacity showing number of persons shall be plainly marked on vessel.

(7) All workers shall be provided with a U.S. Coast Guard approved buoyant life saving device while transported in open boats and/or barges, and where deemed necessary by the department, workers shall wear same while in transport.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-235, filed 7/20/94, effective 9/20/94; Order 74-26, § 296-155-235, filed 5/7/74, effective 6/6/74.]

WAC 296-155-240 Sterilization of protective equipment. Goggles, gloves, respirators and other protectors shall not be interchanged among employees for use unless they have been thoroughly cleaned since last use.

[Order 74-26, § 296-155-240, filed 5/7/74, effective 6/6/74.]

PART C-1

FALL RESTRAINT AND FALL ARREST

WAC 296-155-245 Reserve.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-245, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-245, filed 4/25/95, effective 10/1/95.]

WAC 296-155-24501 Scope and application. This section sets forth requirements for employers to provide and enforce the use of fall protection for employees in construction, alteration, repair, maintenance (including painting and decorating), demolition workplaces, and material handling covered under chapter 296-155 WAC.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24501, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24501, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-24501, filed 1/10/91, effective 2/12/91.]

WAC 296-155-24503 Definitions. Anchorage means a secure point of attachment for lifelines, lanyards, or deceler-

ation devices which is capable of withstanding the forces specified in the applicable sections of chapter 296-155 WAC.

Approved means, for the purpose of this section; tested and certified by the manufacturer, or any recognized national testing laboratory, to possess the strength requirements specified in this section.

Body belt means a Type I safety belt used in conjunction with lanyard or lifeline for fall restraint only.

Full body harness means a configuration of connected straps to distribute a fall arresting force over at least the thighs, shoulders and pelvis, with provisions for attaching a lanyard, lifeline, or deceleration devices.

Full body harness system means a Class III full body harness and lanyard which is attached to an anchorage meeting the requirements of chapter 296-155 WAC, Part C-1; or attached to a horizontal or vertical lifeline which is properly secured to an anchorage(s) capable of withstanding the forces specified in the applicable sections of chapter 296-155 WAC.

Catenary line - see horizontal lifeline.

Competent person means an individual knowledgeable of fall protection equipment, including the manufacturers recommendations and instructions for the proper use, inspection, and maintenance; and who is capable of identifying existing and potential fall hazards; and who has the authority to take prompt corrective action to eliminate those hazards; and who is knowledgeable of the rules contained in this section regarding the erection, use, inspection, and maintenance of fall protection equipment and systems.

Connector means a device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabiner, or it may be an integral component of part of the system (such as a buckle or dee ring sewn into a body belt or body harness, or a snap hook spliced or sewn to a lanyard or self-retracting lanyard).

Continuous fall protection means the design and use of a fall protection system such that no exposure to an elevated fall hazard occurs. This may require more than one fall protection system or a combination of prevention or protection measures.

Control zone means the area between the warning line and the unprotected sides and edges of the walking/working surface.

Deceleration device means any mechanism, such as a rope grab, ripstitch lanyard, specifically woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

Deceleration distance means the additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body belt or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.

Drop line means a vertical lifeline secured to an upper anchorage for the purpose of attaching a lanyard or device.

Failure means load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

Fall arrest system means the use of multiple, approved safety equipment components such as; body harnesses, lanyards, deceleration devices, droplines, horizontal and/or vertical lifelines and anchorages, interconnected and rigged as to arrest a free fall. Compliance with anchorage strength requirements specified in the applicable sections of chapter 296-155 WAC, Part C-1 shall constitute approval of the anchorage.

Fall protection work plan means a written planning document in which the employer identifies all areas on the job site where a fall hazard of 10 feet or greater exists. The plan describes the method or methods of fall protection to be utilized to protect employees, and includes the procedures governing the installation use, inspection, and removal of the fall protection method or methods which are selected by the employer. (See WAC 296-155-24505.)

Fall restraint system means an approved device and any necessary components that function together to restrain an employee in such a manner as to prevent that employee from falling to a lower level. When standard guardrails are selected, compliance with applicable sections governing their construction and use shall constitute approval.

Fall distance means the actual distance from the worker's support to the level where a fall would stop.

Free fall means the act of falling before a personal fall arrest system begins to apply force to arrest the fall.

Free fall distance means the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.

Hardware means snap hooks, D rings, bucklers, carabiners, adjusters, O rings, that are used to attach the components of a fall protection system together.

Horizontal lifeline means a rail, rope, wire, or synthetic cable that is installed in a horizontal plane between two anchorages and used for attachment of a worker's lanyard or lifeline device while moving horizontally; used to control dangerous pendulum like swing falls.

Lanyard means a flexible line of webbing, rope, or cable used to secure a body belt or harness to a lifeline or an anchorage point usually 2, 4, or 6 feet long.

Leading edge means the advancing edge of a floor, roof, or formwork which changes location as additional floor, roof, or formwork sections are placed, formed, or constructed. Leading edges not actively under construction are considered to be "unprotected sides and edges," and positive methods of fall arrest or fall restraint shall be required to protect exposed workers.

Lifeline means a vertical line from a fixed anchorage or between two horizontal anchorages, independent of walking or working surfaces, to which a lanyard or device is secured. Lifeline as referred to in this text is one which is part of a fall

protection system used as back-up safety for an elevated worker.

Locking snap hook means a connecting snap hook that requires two separate forces to open the gate; one to deactivate the gatekeeper and a second to depress and open the gate which automatically closes when released; used to minimize roll out or accidental disengagement.

Low pitched roof means a roof having a slope equal to or less than 4 in 12.

Mechanical equipment means all motor or human propelled wheeled equipment except for wheelbarrows, mop-carts, robotic thermoplastic welders and robotic crimpers.

Positioning belt means a single or multiple strap that can be secured around the worker's body to hold the user in a work position; for example, a lineman's belt, a rebar belt, or saddle belt.

Positioning device system means a body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning.

Restraint line means a line from a fixed anchorage or between two anchorages to which an employee is secured in such a way as to prevent the worker from falling to a lower level.

Roll out means unintentional disengagement of a snap hook caused by the gate being depressed under torque or contact while twisting or turning; a particular concern with single action snap hooks that do not have a locking gatekeeper.

Roof means the exterior surface on the top of a building. This does not include floors or form work which, because a building has not been completed, temporarily become the top surface of a building.

Roofing work means the hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.

Rope grab means a fall arrester that is designed to move up or down a lifeline suspended from a fixed overhead or horizontal anchorage point, or lifeline, to which the belt or harness is attached. In the event of a fall, the rope grab locks onto the lifeline rope through compression to arrest the fall. The use of a rope grab device is restricted for all restraint applications. (Refer to WAC 296-155-24510 (1)(b)(iii)).

Safety line - see lifeline.

Safety monitor system means a system of fall restraint used in conjunction with a warning line system only, where a competent person as defined by this part, having no additional duties, monitors the proximity of workers to the fall hazard when working between the warning line and the unprotected sides and edges including, the leading edge of a low pitched roof or walking/working surface.

Self retracting lifeline means a deceleration device which contains a drum wound line which may be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which after onset of a fall, automatically locks the drum and arrests the fall.

Shock absorbing lanyard means a flexible line of webbing, cable, or rope used to secure a body belt or harness to a

lifeline or anchorage point that has an integral shock absorber.

Single action snap hook means a connecting snap hook that requires a single force to open the gate which automatically closes when released.

Snap hook means a self-closing connecting device with a gatekeeper latch or similar arrangement that will remain closed until manually opened. This includes single action snap hooks that open when the gatekeeper is depressed and double action snap hooks that require a second action on a gatekeeper before the gate can be opened.

Static line - see horizontal lifeline.

Strength member means any component of a fall protection system that could be subject to loading in the event of a fall.

Steep roof means a roof having a slope greater than 4 in 12.

Unprotected sides and edges means any side or edge (except at entrances to points of access) of a floor, roof, ramp or runway where there is no wall or guardrail system as defined in WAC 296-155-505(5).

Walking/working surface means for the purpose of this section, any area whose dimensions are 45 inches or greater in all directions, through which workers pass or conduct work.

Warning line system means a barrier erected on a walking and working surface or a low pitch roof (4 in 12 or less), to warn employees that they are approaching an unprotected fall hazard(s).

Work area means that portion of a walking/working surface where job duties are being performed.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24503, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24503, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-24503, filed 1/10/91, effective 2/12/91.]

WAC 296-155-24505 Fall protection work plan. (1) The employer shall develop and implement a written fall protection work plan including each area of the work place where the employees are assigned and where fall hazards of 10 feet or more exist.

(2) The fall protection work plan shall:

(a) Identify all fall hazards in the work area.

(b) Describe the method of fall arrest or fall restraint to be provided.

(c) Describe the correct procedures for the assembly, maintenance, inspection, and disassembly of the fall protection system to be used.

(d) Describe the correct procedures for the handling, storage, and securing of tools and materials.

(e) Describe the method of providing overhead protection for workers who may be in, or pass through the area below the work site.

(f) Describe the method for prompt, safe removal of injured workers.

(g) Be available on the job site for inspection by the department.

(3) Prior to permitting employees into areas where fall hazards exist the employer shall:

(a) Ensure that employees are trained and instructed in the items described in subsection (2)(a) through (f) of this section.

(b) Inspect fall protection devices and systems to ensure compliance with WAC 296-155-24510.

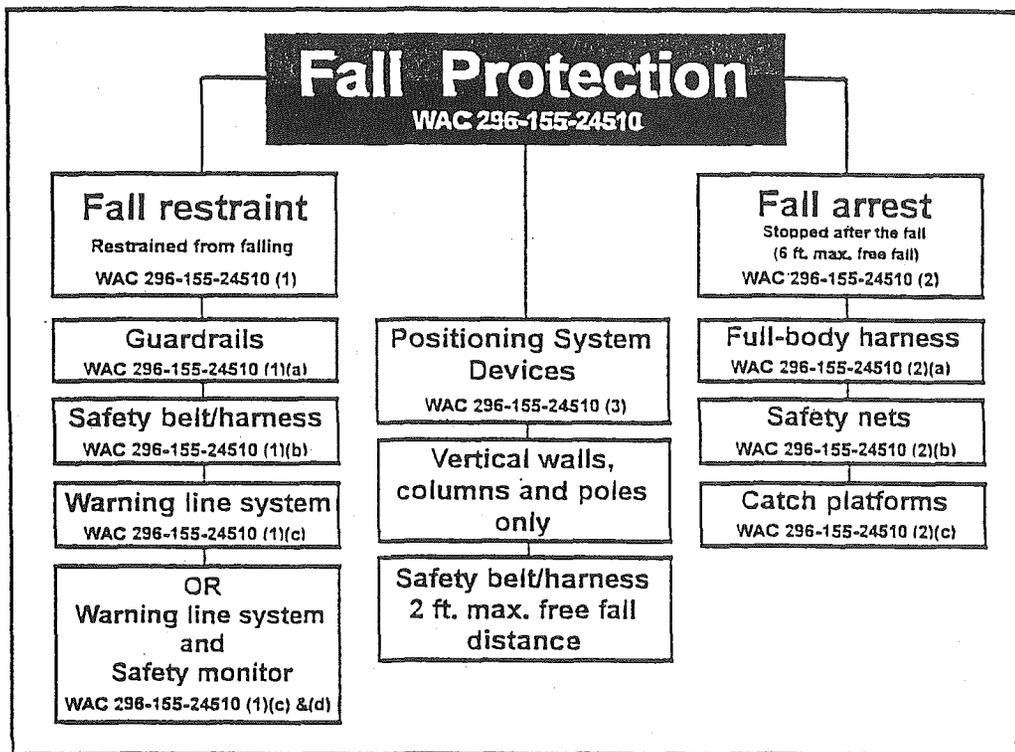
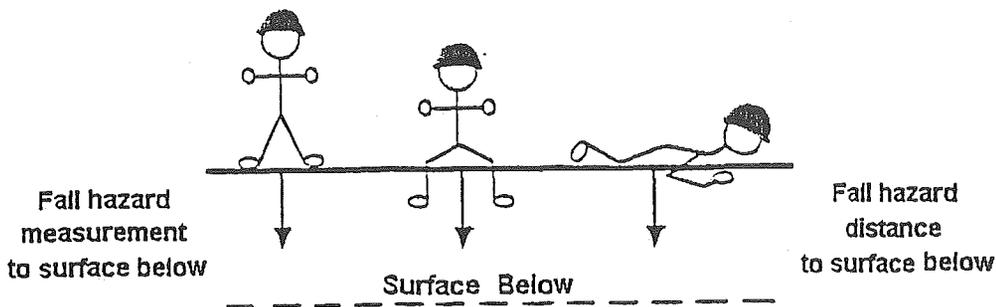
(4) Training of employees as required by this section shall be documented and shall be available on the job site.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24505, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24505, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-24505, filed 1/10/91, effective 2/12/91.]

WAC 296-155-24507 Reserve.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24507, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24507, filed 4/25/95, effective 10/1/95.]

WAC 296-155-24510 Fall restraint, fall arrest systems. When employees are exposed to a hazard of falling from a location 10 feet or more in height, the employer shall ensure that fall restraint, fall arrest systems or positioning device systems are provided, installed, and implemented according to the following requirements.



(1) Fall restraint protection shall consist of:

(a) Standard guardrails as described in chapter 296-155 WAC, Part K.

(b) Safety belts and/or harness attached to securely rigged restraint lines.

(i) Safety belts and/or harness shall conform to ANSI Standard:

Class I body belt

Class II chest harness

Class III full body harness

Class IV suspension/position belt

(ii) All safety belt and lanyard hardware assemblies shall be capable of withstanding a tensile loading of 4,000 pounds without cracking, breaking, or taking a permanent deformation.

(iii) Rope grab devices are prohibited for fall restraint applications unless they are part of a fall restraint system designed specifically for the purpose by the manufacturer, and used in strict accordance with the manufacturer's recommendations and instructions.

(iv) The employer shall ensure component compatibility.

(v) Components of fall restraint systems shall be inspected prior to each use for mildew, wear, damage, and other deterioration, and defective components shall be removed from service if their function or strength have been adversely affected.

(vi) Anchorage points used for fall restraint shall be capable of supporting 4 times the intended load.

(vii) Restraint protection shall be rigged to allow the movement of employees only as far as the sides and edges of the walking/working surface.

(c) A warning line system as prescribed in WAC 296-155-24515(3) and supplemented by the use of a safety monitor system as prescribed in WAC 296-155-24521 to protect workers engaged in duties between the forward edge of the warning line and the unprotected sides and edges, including the leading edge, of a low pitched roof or walking/working surface.

(d) Warning line and safety monitor systems as described in WAC 296-155-24515 (3) through (4)(f) and WAC 296-155-24520 respectively are prohibited on surfaces exceeding a 4 in 12 pitch, and on any surface whose dimensions are less than 45 inches in all directions.

(2) Fall arrest protection shall consist of:

(a) Full body harness system.

(i) An approved Class III full body harness shall be used.

(ii) Body harness systems or components subject to impact loading shall be immediately removed from service and shall not be used again for employee protection unless inspected and determined by a competent person to be undamaged and suitable for reuse.

(iii) All safety lines and lanyards shall be protected against being cut or abraded.

(iv) The attachment point of the body harness shall be located in the center of the wearer's back near shoulder level, or above the wearer's head.

(v) Body harness systems shall be rigged to minimize free fall distance with a maximum free fall distance allowed of 6 feet, and such that the employee will not contact any lower level.

(vi) Hardware shall be drop forged, pressed or formed steel, or made of materials equivalent in strength.

(vii) Hardware shall have a corrosion resistant finish, and all surfaces and edges shall be smooth to prevent damage to the attached body harness or lanyard.

(viii) When vertical lifelines (droplines) are used, not more than one employee shall be attached to any one lifeline.

Note: The system strength needs in the following items are based on a total combined weight of employee and tools of no more than 310 pounds. If combined weight is more than 310 pounds, appropriate allowances must be made or the system will not be deemed to be in compliance.

(ix) Full body harness systems shall be secured to anchorages capable of supporting 5,000 pounds per employee except: When self retracting lifelines or other

deceleration devices are used which limit free fall to two feet, anchorages shall be capable of withstanding 3,000 pounds.

(x) Vertical lifelines (droplines) shall have a minimum tensile strength of 5,000 pounds (22.2 kN), except that self retracting lifelines and lanyards which automatically limit free fall distance to two feet (.61 m) or less shall have a minimum tensile strength of 3,000 pounds (13.3 kN).

(xi) Horizontal lifelines shall have a tensile strength capable of supporting a fall impact load of at least 5,000 pounds (22.2 kN) per employee using the lifeline, applied anywhere along the lifeline.

(xii) Lanyards shall have a minimum tensile strength of 5,000 pounds (22.2 kN).

(xiii) All components of body harness systems whose strength is not otherwise specified in this subsection shall be capable of supporting a minimum fall impact load of 5,000 pounds (22.2 kN) applied at the lanyard point of connection.

(xiv) Snap hooks shall not be connected to loops made in webbing type lanyards.

(xv) Snap hooks shall not be connected to each other.

(xvi) Not more than one snap hook shall be connected to any one D ring unless they are the double locking type.

(xvii) Full body harness systems shall be inspected prior to each use for mildew, wear, damage, and other deterioration, and defective components shall be removed from service if their function or strength have been adversely affected.

(b) Safety net systems. Safety net systems and their use shall comply with the following provisions:

(i) Safety nets shall be installed as close as practicable under the surface on which employees are working, but in no case more than 30 feet (9.1 m) below such level unless specifically approved in writing by the manufacturer. The potential fall area to the net shall be unobstructed.

(ii) Safety nets shall extend outward from the outermost projection of the work surface as follows:

Vertical distance from working level to horizontal plane of net	Minimum required horizontal distance of outer edge of net from the edge of the working surface
Up to 5 feet	8 feet
More than 5 feet up to 10 feet ...	10 feet
More than 10 feet	13 feet

(iii) Safety nets shall be installed with sufficient clearance under them to prevent contact with the surface or structures below when subjected to an impact force equal to the drop test specified in (b)(iv) of this subsection.

(iv) Safety nets and their installations shall be capable of absorbing an impact force equal to that produced by the drop test specified in (b)(iv)(A) and (B) of this subsection.

(A) Except as provided in (b)(iv)(B) of this subsection, safety nets and safety net installations shall be drop-tested at the job site after initial installation and before being used as a fall protection system, whenever relocated, after major repair, and at 6-month intervals if left in one place. The drop-test shall consist of a 400 pound (180 kg) bag of sand 30 ± 2 inches (76 ± 5 cm) in diameter dropped into the net from the highest walking/working surface at which employees are

exposed to fall hazards, but not from less than 42 inches (1.1 m) above that level.

(B) When the employer can demonstrate that it is unreasonable to perform the drop-test required by (b)(iv)(A) of this subsection, the employer (or a designated competent person) shall certify that the net and net installation is in compliance with the provisions of (b)(iii) and (b)(iv)(A) of this subsection by preparing a certification record prior to the net being used as a fall protection system. The certification record must include an identification of the net and net installation for which the certification record is being prepared; the date that it was determined that the identified net and net installation were in compliance with (b)(iii) of this subsection and the signature of the person making the determination and certification. The most recent certification record for each net and net installation shall be available at the job site for inspection.

(v) Defective nets shall not be used. Safety nets shall be inspected at least once a week for wear, damage, and other deterioration. Defective components shall be removed from service. Safety nets shall also be inspected after any occurrence which could affect the integrity of the safety net system.

(vi) Materials, scrap pieces, equipment, and tools which have fallen into the safety net shall be removed as soon as possible from the net and at least before the next work shift.

(vii) The maximum size of each safety net mesh opening shall not exceed 36 square inches (230 cm²) nor be longer than 6 inches (15 cm) on any side, and the opening, measured center-to-center of mesh ropes or webbing, shall not be longer than 6 inches (15 cm). All mesh crossings shall be secured to prevent enlargement of the mesh opening.

(viii) Each safety net (or section of it) shall have a border rope for webbing with a minimum breaking strength of 5,000 pounds (22.2 kN).

(ix) Connections between safety net panels shall be as strong as integral net components and shall be spaced not more than 6 inches (15 cm) apart.

(c) Catch platforms.

(i) A catch platform shall be installed within 10 vertical feet of the work area.

(ii) The catch platforms width shall equal the distance of the fall but shall be a minimum of 45 inches wide and shall be equipped with standard guardrails on all open sides.

(3) Positioning device systems. Positioning device systems and their use shall conform to the following provisions:

(a) Positioning devices shall be rigged such that an employee cannot free fall more than 2 feet (.61 m).

(b) Positioning devices shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds (13.3 kN), whichever is greater.

(c) Connectors shall be drop forged, pressed or formed steel, or made of equivalent materials.

(d) Connectors shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to interfacing parts of this system.

(e) Connecting assemblies shall have a minimum tensile strength of 5,000 pounds (22.2 kN).

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(f) Dee-rings and snap-hooks shall be proof-tested to a minimum tensile load of 3,600 pounds (16 kN) without cracking, breaking, or taking permanent deformation.

(g) Snap-hooks shall be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snap-hook by depression of the snap-hook keeper by the connected member, or shall be a locking type snap-hook designed and used to prevent disengagement of the snap-hook by the contact of the snap-hook keeper by the connected member. As of January 1, 1998, only locking type snap-hooks shall be used.

(h) Unless the snap-hook is a locking type and designed for the following connections, snap-hooks shall not be engaged:

(i) Directly to webbing, rope or wire rope;

(ii) To each other;

(iii) To a dee-ring to which another snap-hook or other connector is attached;

(iv) To a horizontal lifeline; or

(v) To any object which is incompatibly shaped or dimensioned in relation to the snap-hook such that unintentional disengagement could occur by the connected object being able to depress the snap-hook keeper and release itself.

(i) Positioning device systems shall be inspected prior to each use for wear, damage, and other deterioration, and defective components shall be removed from service.

(j) Body belts, harnesses, and components shall be used only for employee protection (as part of a personal fall arrest system or positioning device system) and not to hoist materials.

(4) Droplines or lifelines used on rock scaling operations, or in areas where the lifeline may be subjected to cutting or abrasion, shall be a minimum of 7/8 inch wire core manila rope. For all other lifeline applications, a minimum of 3/4 inch manila or equivalent, with a minimum breaking strength of 5,000 pounds, shall be used.

(5) Safety harnesses, lanyards, lifelines or droplines, independently attached or attended, shall be used while performing the following types of work when other equivalent type protection is not provided:

(a) Work performed in permit required confined spaces and other confined spaces shall follow the procedures as described in chapter 296-62 WAC, Part M.

(b) Work on hazardous slopes, or dismantling safety nets, working on poles or from boatswains chairs at elevations greater than six feet (1.83 m), swinging scaffolds or other unguarded locations.

(c) Work on skips and platforms used in shafts by crews when the skip or cage does not occlude the opening to within one foot (30.5 cm) of the sides of the shaft, unless cages are provided.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24510, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24510, filed 4/25/95, effective 10/1/95; 95-04-007, § 296-155-24510, filed 1/18/95, effective 3/1/95; 93-19-142 (Order 93-04), § 296-155-24510, filed 9/22/93, effective 11/1/93; 91-24-017 (Order 91-07), § 296-155-24510, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-24510, filed 1/10/91, effective 2/12/91.]

WAC 296-155-24515 Guarding of low pitched roof perimeters. (1) General provisions. During the performance

of work on low pitched roofs with a potential fall hazard greater than 10 feet, the employer shall ensure that employees engaged in such work be protected from falling from all unprotected sides and edges of the roof as follows:

(a) By the use of a fall restraint or fall arrest systems, as defined in WAC 296-155-24510; or

(b) By the use of a warning line system erected and maintained as provided in subsection (3) of this section and supplemented for employees working between the warning line and the roof edge by the use of a safety monitor system as described in WAC 296-155-24521.

(c) Mechanical equipment shall be used or stored only in areas where employees are protected by a warning line system, or fall restraint, or fall arrest systems as described in WAC 296-155-24510. Mechanical equipment may not be used or stored where the only protection is provided by the use of a safety monitor.

(2) Exceptions.

(a) The provisions of subsection (1)(a) of this section do not apply at points of access such as stairways, ladders, and ramps, or when employees are on the roof only to inspect, investigate, or estimate roof level conditions. Roof edge materials handling areas and materials storage areas shall be guarded as provided in subsection (4) of this section.

(b) Employees engaged in roofing on low-pitched roofs less than 50 feet wide, may elect to use a safety monitor system without warning lines.

(3) Warning lines systems.

(a) Warning lines shall be erected around all sides of the work area.

(i) When mechanical equipment is not being used, the warning line shall be erected not less than six feet (1.8 meters) from the edge of the roof.

(ii) When mechanical equipment is being used, the warning line shall be erected not less than six feet (1.8 meters) from the roof edge which is parallel to the direction of mechanical equipment operation, and not less than 10 feet (3.1 meters) from the roof edge which is perpendicular to the direction of mechanical equipment operation.

(b) The warning line shall consist of a rope, wire, or chain and supporting stanchions erected as follows:

(i) The rope, wire, or chain shall be flagged at not more than six foot (1.8 meter) intervals with high visibility material.

(ii) The rope, wire, or chain shall be rigged and supported in such a way that its lowest point (including sag) is no less than 36 inches (91.4 cm) from the roof surface and its highest point is no more than 42 inches (106.7 cm) from the roof surface.

(iii) After being erected, with the rope, wire or chain attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds (71 Newtons) applied horizontally against the stanchion, 30 inches (0.76 meters) above the roof surface, perpendicular to the warning line, and in the direction of the roof edge.

(iv) The rope, wire, or chain shall have a minimum tensile strength of 200 pounds (90 kilograms), and after being attached to the stanchions, shall be capable of supporting, without breaking, the loads applied to the stanchions.

(v) The line shall be attached at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.

(c) Access paths shall be erected as follows:

(i) Points of access, materials handling areas, and storage areas shall be connected to the work area by a clear access path formed by two warning lines.

(ii) When the path to a point of access is not in use, a rope, wire, or chain, equal in strength and height to the warning line, shall be placed across the path at the point where the path intersects the warning line erected around the work area.

(4) Roof edge materials handling areas and materials storage. Employees working in a roof edge materials handling or materials storage area located on a low pitched roof with a ground to eave height greater than 10 feet shall be protected from falling along all unprotected roof sides and edges of the area.

(a) When guardrails are used at hoisting areas, a minimum of four feet of guardrail shall be erected on each side of the access point through which materials are hoisted.

(b) A chain or gate shall be placed across the opening between the guardrail sections when hoisting operations are not taking place.

(c) When guardrails are used at bitumen pipe outlet, a minimum of four feet of guardrail shall be erected on each side of the pipe.

(d) When safety belt/harness systems are used, they shall not be attached to the hoist.

(e) When fall restraint systems are used, they shall be rigged to allow the movement of employees only as far as the roof edge.

(f) Materials shall not be stored within six feet of the roof edge unless guardrails are erected at the roof edge.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24515, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24515, filed 4/25/95, effective 10/1/95; 91-24-017 (Order 91-07), § 296-155-24515, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-24515, filed 1/10/91, effective 2/12/91.]

WAC 296-155-24519 Reserve.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24519, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24519, filed 4/25/95, effective 10/1/95.]

WAC 296-155-24520 Leading edge control zone. (1)

When performing leading edge work, the employer shall ensure that a control zone be established according to the following requirements:

(a) The control zone shall begin a minimum of 6 feet back from the leading edge to prevent exposure by employees who are not protected by fall restraint or fall arrest systems.

(b) The control zone shall be separated from other areas of the low pitched roof or walking/working surface by the erection of a warning line system.

(c) The warning line system shall consist of wire, rope, or chain supported on stanchions, or a method which provides equivalent protection.

(d) The spacing of the stanchions and support of the line shall be such that the lowest point of the line (including sag) is not less than 36 inches from the walking/working surface, and its highest point is not more than 42 inches (106.7 cm) from the walking/working surface.

(e) Each line shall have a minimum tensile strength of 200 pounds (90 kilograms).

(f) Each line shall be flagged or clearly marked with high visibility materials at intervals not to exceed 6 feet.

(g) After being erected with the rope, or chain attached, stanchions shall be capable of resisting without tipping over, a force of at least 16 pounds (71 Newtons) applied horizontally against the stanchions 30 inches (0.76 meters) above the roof surface, perpendicular to the warning line and in the direction of the roof edge.

(2) When positive means of fall restraint as described in WAC 296-155-24510 (1)(a) through (d), or fall arrest as described in WAC 296-155-24510 (2) through (5)(c) are not utilized, a safety monitor system as described in WAC 296-155-24521 shall be implemented to protect employees working between the forward edge of the warning line and the leading edge.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24520, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24520, filed 4/25/95, effective 10/1/95; 91-24-017 (Order 91-07), § 296-155-24520, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-24520, filed 1/10/91, effective 2/12/91.]

WAC 296-155-24521 Safety monitor system. (1) A safety monitor system (SMS) may be used in conjunction with a warning line system as a method of guarding against falls during work on low pitched roofs and leading edge work only.

(2) When selected, the employer shall ensure that the safety monitor system shall be addressed in the fall protection work plan, include the name of the safety monitor(s) and the extent of their training in both the safety monitor and warning line systems, and shall ensure that the following requirements are met.

(3) The safety monitor system shall not be used when adverse weather conditions create additional hazards.

(4) A person acting in the capacity of safety monitor(s) shall be trained in the function of both the safety monitor and warning lines systems, and shall:

(a) Be a competent person as defined in WAC 296-155-24503.

(b) Have control authority over the work as it relates to fall protection.

(c) Be instantly distinguishable over members of the work crew.

(d) Engage in no other duties while acting as safety monitor.

(e) Be positioned in relation to the workers under their protection, so as to have a clear, unobstructed view and be able to maintain normal voice communication.

(f) Not supervise more than eight exposed workers at one time.

(5) Control zone workers shall be distinguished from other members of the crew by wearing highly visible, distinct-

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ive, and uniform apparel readily distinguishing them from other members of the crew only while in the control zone.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24521, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24521, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-24521, filed 1/10/91, effective 2/12/91.]

WAC 296-155-24522 Reserve.

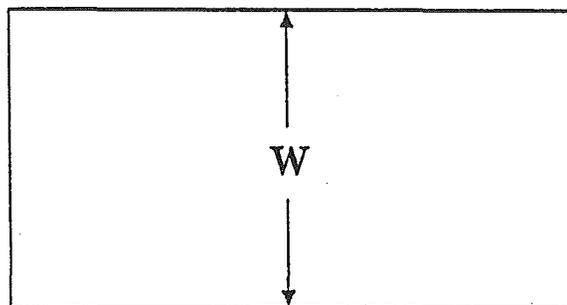
[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24522, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24522, filed 4/25/95, effective 10/1/95.]

WAC 296-155-24523 Appendix A to Part C-1—Determining roof widths nonmandatory guidelines for complying with WAC 296-155-24515 (2)(b). (1) This appendix serves as a guideline to assist employers complying with the requirements of WAC 296-155-24515 (2)(b). WAC 296-155-24515 (2)(b) allows the use of a safety monitoring system alone as a means of providing fall protection during the performance of roofing operations on low-sloped roofs 50 feet (15.25 m) or less in width. Each example in the appendix shows a roof plan or plans and indicates where each roof or roof area is to be measured to determine its width. Section views or elevation views are shown where appropriate. Some examples show "correct" and "incorrect" subdivisions of irregularly shaped roofs divided into smaller, regularly shaped areas. In all examples, the dimension selected to be the width of an area is the lesser of the two primary dimensions of the area, as viewed from above. Example A shows that on a simple rectangular roof, width is the lesser of the two primary overall dimensions. This is also the case with roofs which are sloped toward or away from the roof center, as shown in Example B.

(2) Many roofs are not simple rectangles. Such roofs may be broken down into subareas as shown in Example C. The process of dividing a roof area can produce many different configurations. Example C gives the general rule of using dividing lines of minimum length to minimize the size and number of the areas which are potentially less than 50 feet (15.25 m) wide. The intent is to minimize the number of roof areas where safety monitoring systems alone are sufficient protection.

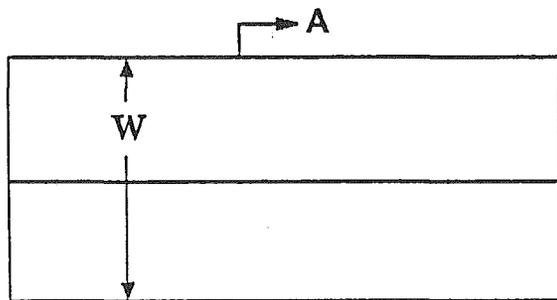
(3) Roofs which are comprised of several separate, non-contiguous roof areas, as in Example D, may be considered as a series of individual roofs. Some roofs have penthouses, additional floors, courtyard openings, or similar architectural features; Example E shows how the rule for dividing roofs into subareas is applied to such configurations. Irregular, non-rectangular roofs must be considered on an individual basis, as shown in Example F.

Example A
Rectangular Shaped Roof

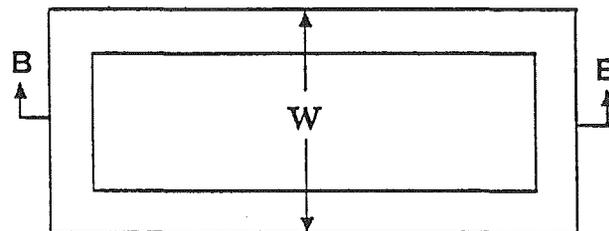


PLAN VIEW

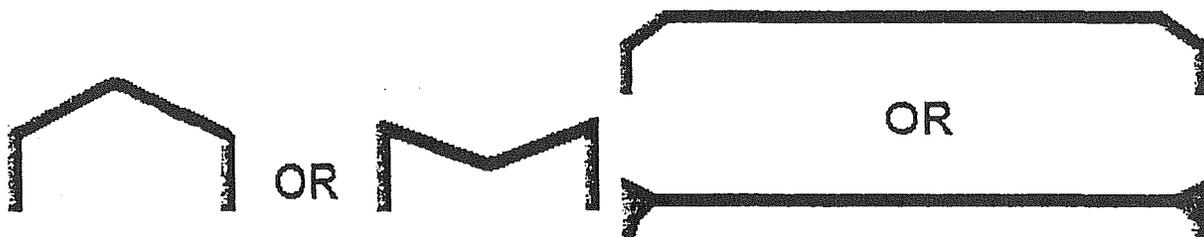
Example B
Sloped Rectangular Shaped Roofs



PLAN VIEW → A



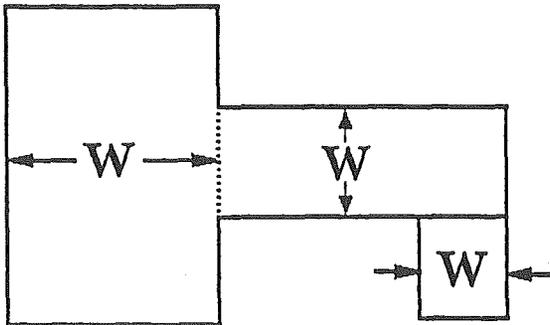
PLAN VIEW



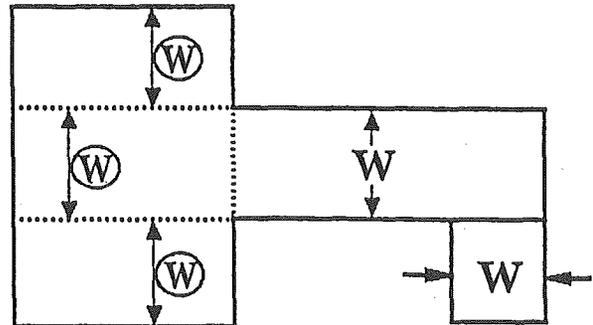
SECTION A-A

SECTION B-B

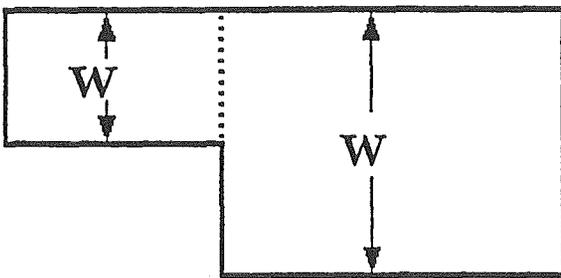
Example C
Irregularly Shaped Roofs With Rectangular Shaped Sections



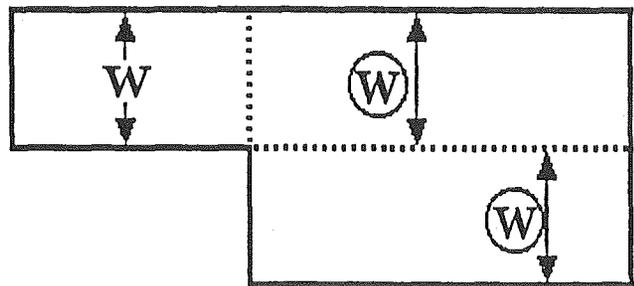
Correct



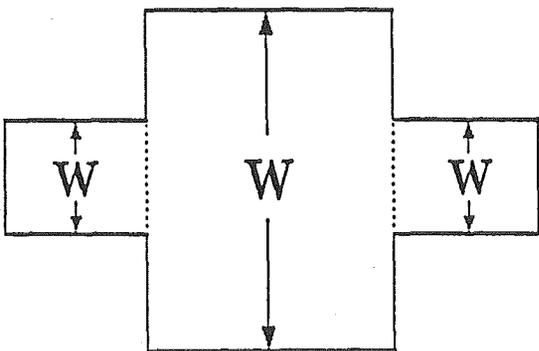
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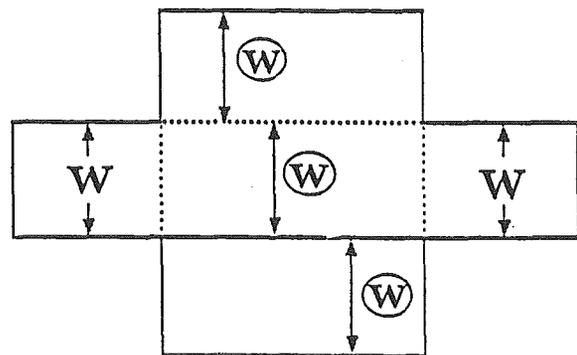
Correct



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Correct

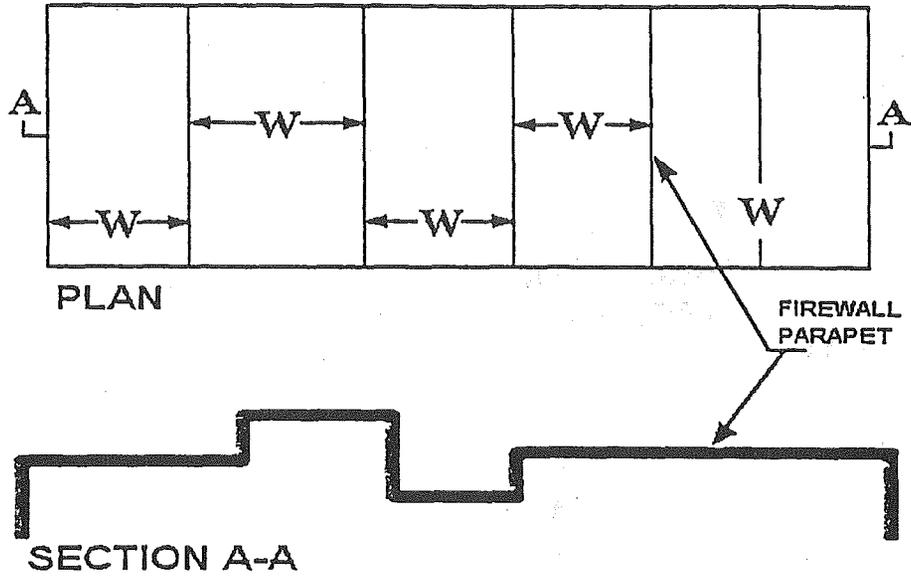


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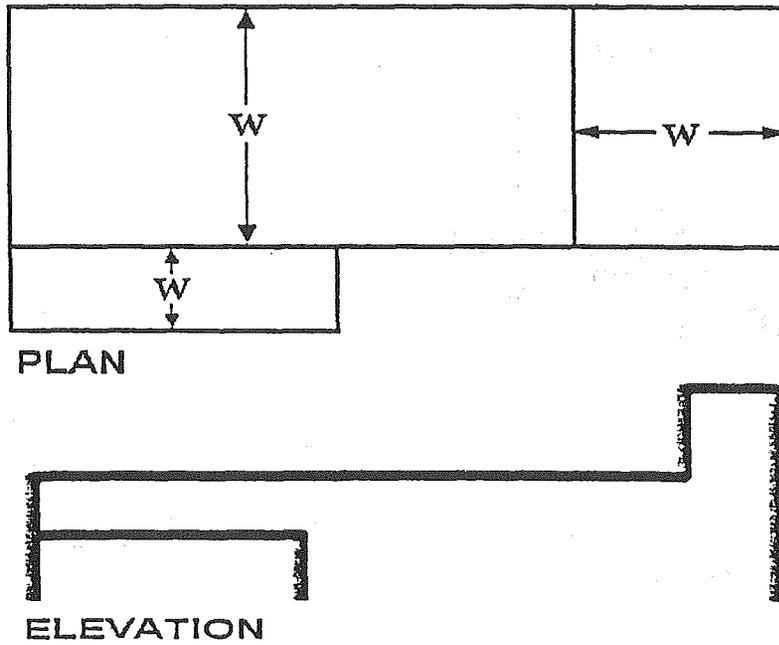
Such roofs are to be divided into subareas by using dividing lines of minimum length to minimize the size and number of the areas which are potentially less than or equal to 50 feet (15.25 m) in width, in order to limit the size of roof areas where the safety monitoring system alone can be used (WAC 296-155-24515(2)(b)). Dotted lines are used in the examples to show the location of dividing lines, (W) denotes incorrect measurements of width.

Example D
Separate, Non-Contiguous Roof Areas

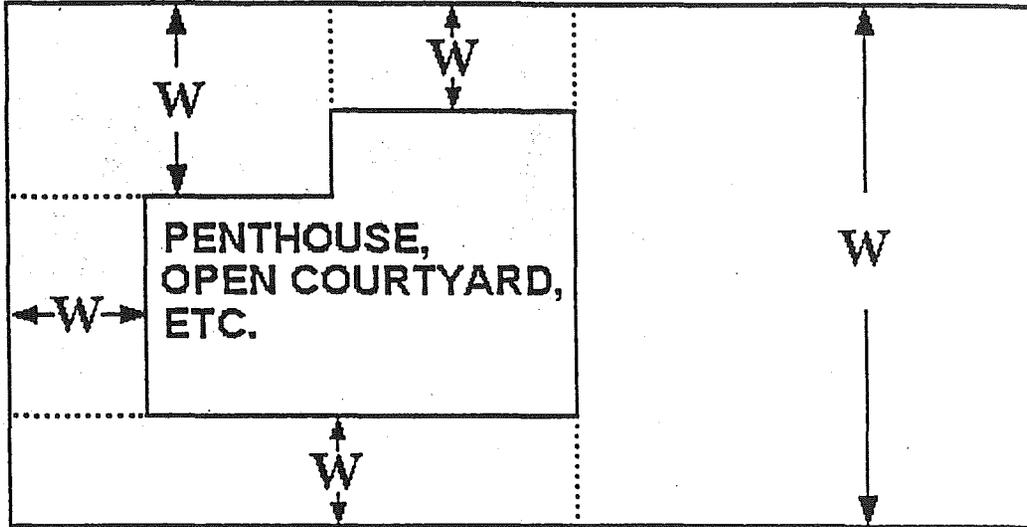
1.



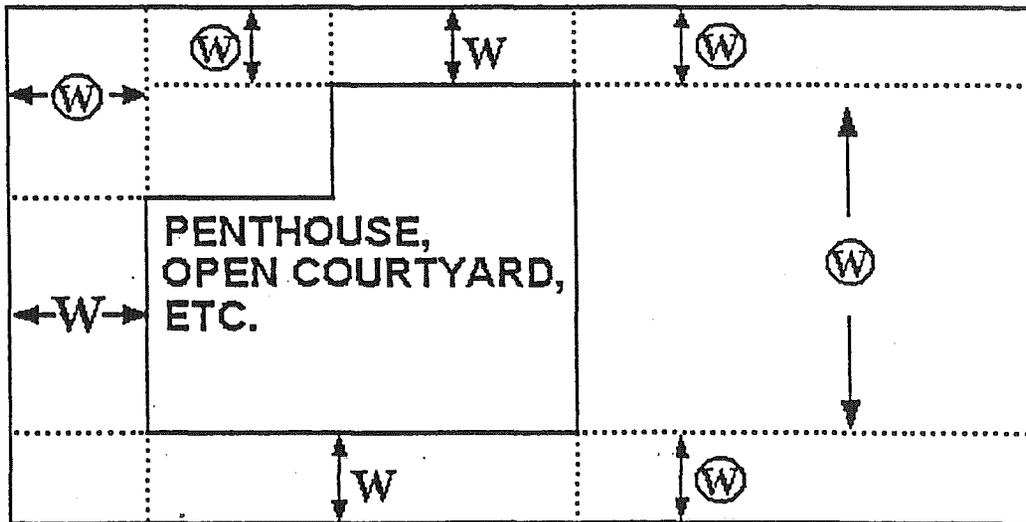
2.



Example E
Roofs With Penthouses, Open Courtyards, Additional Floors, etc.

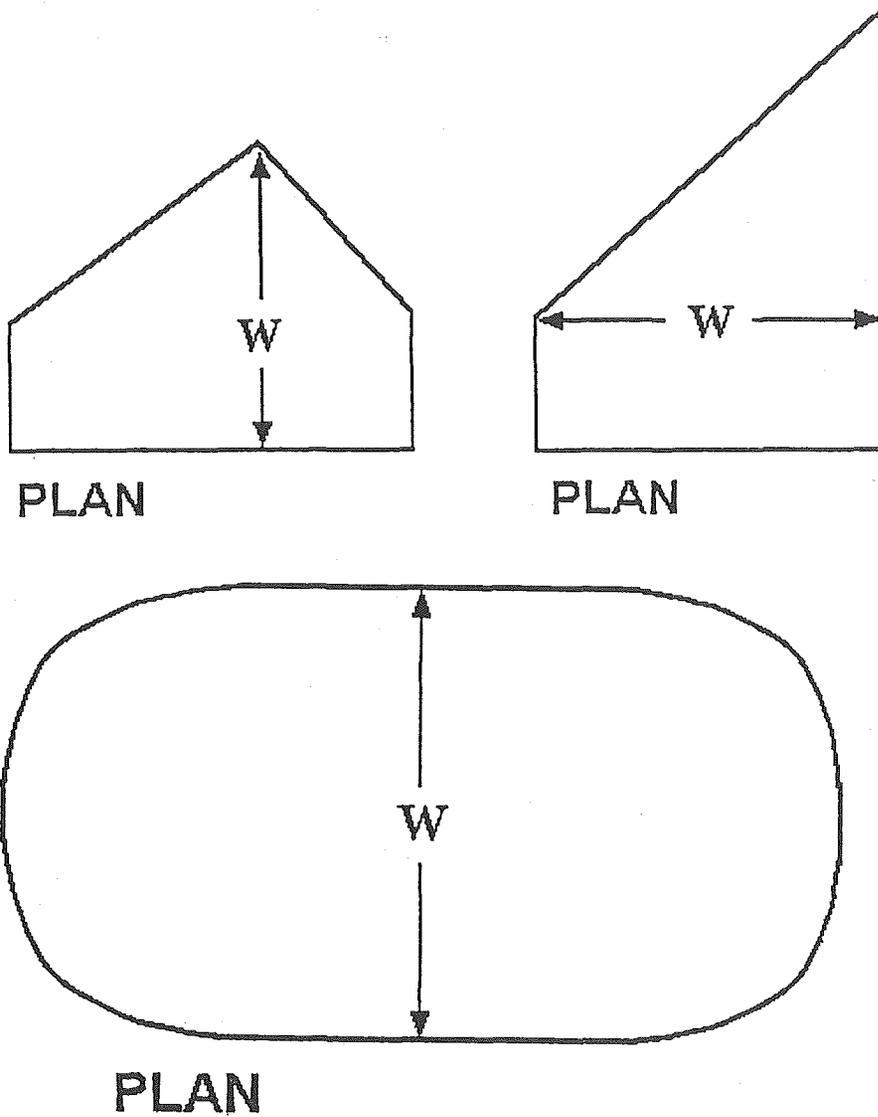


CORRECT



INCORRECT

Example F
Irregular, Non-Rectangular Shaped Roofs



[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24523, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24523, filed 4/25/95, effective 10/1/95.]

WAC 296-155-24524 Reserve.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24524, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24524, filed 4/25/95, effective 10/1/95.]

WAC 296-155-24525 Appendix B to Part C-1—Fall restraint and fall arrest (employer information only). Additional standards that require the use of fall restraint and/or fall arrest protection for employees are listed below:

- Ladders WAC 296-155-480 (1)(r)
- WAC 296-155-480 (1)(s)
- Scaffolds WAC 296-155-483(7)

- Boom Supported Elevating Work Platforms WAC 296-155-489
- Vehicle Mounted Elevated and Rotating Work Platforms WAC 296-155-490 (2)(b)(v)
- Crane and Derrick Supported Work Platforms WAC 296-155-528 (6)(c)
- WAC 296-155-528 (6)(d)
- WAC 296-155-528 (7)(i)
- WAC 296-155-528 (7)(j)
- WAC 296-155-528 (7)(k)
- WAC 296-155-528 (10)(h)
- Open Sided Floors WAC 296-155-505 (4)(a) through (f)
- Pile Driving WAC 296-155-620 (1)(i)
- Vertical Slip Forms WAC 296-155-688(9)
- Placing and Removal of Forms WAC 296-155-689(4)
- Steel Erection Temporary Floors WAC 296-155-705 (2)(b)
- Tunneling (Skips and Platforms) WAC 296-155-730 (8)(e)

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-24525, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-24525, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-24525, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-24525, filed 1/10/91, effective 2/12/91.]

PART D FIRE PROTECTION AND PREVENTION

WAC 296-155-250 Definitions applicable to this part.

(1) "Approved" for the purpose of this part, means equipment that has been listed or approved by a nationally recognized testing laboratory such as Factory Mutual Engineering Corp., or Underwriters' Laboratories, Inc., federal agencies such as United States Mine Safety and Health Administration or United States Coast Guard, which issue approvals for such equipment, or the department of labor and industries.

(2) "Closed container" means a container so sealed by means of a lid or other device that neither liquid nor vapor will escape from it at ordinary temperatures.

(3) "Combustible liquid" means any liquid having a flashpoint at or above 100°F (37.8°C). Combustible liquids shall be divided into two classes as follows:

(a) "Class II liquids" shall include those with flashpoints at or above 100°F (37.8°C) and below 140°F (60°C), except any mixture having components with flashpoints of 200°F (93.3°C) or higher, the volume of which make up 99 percent or more of the total volume of the mixture.

(b) "Class III liquids" shall include those with flashpoints at or above 140°F (60°C). Class III liquids are subdivided into two subclasses:

(i) "Class IIIA liquids" shall include those with flashpoints at or above 140°F (60°C) and below 200°F (93.3°C), except any mixture having components with flashpoints of 200°F (93.3°C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

(ii) "Class IIIB liquids" shall include those with flashpoints at or above 200°F (93.3°C). This section does not cover Class IIIB liquids. Where the term "Class III liquids" is used in this section, it shall mean only Class IIIA liquids.

(c) When a combustible liquid is heated for use to within 30°F (16.7°C) of its flashpoint, it shall be handled in accordance with the requirements for the next lower class of liquids.

(4) "Combustion" means any chemical process that involves oxidation sufficient to produce light or heat.

(5) "Fire brigade" means an organized group of employees that are knowledgeable, trained, and skilled in the safe evacuation of employees during emergency situations and in assisting in fire fighting operations.

(6) "Fire resistance" means so resistant to fire that, for specified time and under conditions of a standard heat intensity, it will not fail structurally and will not permit the side away from the fire to become hotter than a specified temperature. For purposes of this part, fire resistance shall be determined by the Standard Methods of Fire Tests of Building Construction and Materials, NFPA 251-72.

(7) "Flammable" means capable of being easily ignited, burning intensely or having a rapid rate of flame spread.

(8) "Flammable liquid" means any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up 99 percent or more of the total volume of the mixture. Flammable liquids shall be known as Class I liquids. Class I liquids are divided into three classes as follows:

(a) Class IA shall include liquids having flashpoints below 73°F (22.8°C) and having a boiling point below 100°F (37.8°C).

(b) Class IB shall include liquids having flashpoints below 73°F (22.8°C) and having a boiling point at or above 100°F (37.8°C).

(c) Class IC shall include liquids having flashpoints at or above 73°F (22.8°C) and below 100°F (37.8°C).

(9) "Flashpoint" means the minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid, and shall be determined as follows:

(a) For a liquid which has a viscosity of less than 45 SUS at 100°F (37.8°C), does not contain suspended solids, and does not have a tendency to form a surface film while under test, the procedure specified in the Standard Method of Test for Flashpoint by Tag Closed Tester (ASTM D-56-70) shall be used.

(b) For a liquid which has a viscosity of 45 SUS or more at 100°F (37.8°C), or contains suspended solids, or has a tendency to form a surface film while under test, the Standard Method of Test for Flashpoint by Pensky-Martens Closed Tester (ASTM D-93-71) shall be used, except that the methods specified in Note 1 to section 1.1 of ASTM D-93-71 may be used for the respective materials specified in the note.

(10) "Liquified petroleum gases" "LPG" and "LP Gas" mean and include any material which is composed predominantly of any of the following hydrocarbons, or mixtures of them, such as propane, propylene, butane (normal butane or isobutane), and butylenes.

(11) "Portable tank" means a closed container having a liquid capacity more than 60 U.S. gallons, and not intended for fixed installation.

(12) "Safety can" means an approved closed container, of not more than 5 gallons capacity, having a spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.

(13) "Salamander" means a portable heating device, solid or liquid fueled, which is not vented to the outdoor atmosphere.

(14) "Vapor pressure" means the pressure, measured in pounds per square inch (absolute), exerted by a volatile liquid as determined by the "Standard Method of Test for Vapor Pressure of Petroleum Products (Reid Method)," (ASTM D-323-68).

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-250, filed 1/21/86; Order 74-26, § 296-155-250, filed 5/7/74, effective 6/6/74.]

WAC 296-155-260 Fire protection. (1) General requirements.

(a) The employer shall be responsible for development of a fire protection program to be followed throughout all phases of construction and demolition work, and the employer shall provide for fire fighting equipment as specified in this part. As fire hazards occur, there shall be no delay in providing necessary equipment.

(b) Access to all available fire fighting equipment shall be maintained at all times.

(c) All fire fighting equipment, provided by the employer, shall be conspicuously located.

(d) All fire fighting equipment shall be periodically inspected by a competent person, and maintained in operating condition. Defective equipment shall be immediately replaced.

(e) As warranted by the project, the employer shall provide a trained and equipped fire fighting organization (fire brigade) to assure adequate protection to life.

(2) Water supply.

(a) A temporary or permanent water supply, of sufficient volume, duration, and pressure, required to properly operate fire fighting equipment shall be made available as soon as combustible materials accumulate.

(b) Where underground water mains are to be provided, they shall be installed, completed, and made available for use as soon as practicable.

(3) Portable fire fighting equipment.

(a) A fire extinguisher, rated not less than 2A, shall be provided for each 3,000 square feet of a combustible building area, or major fraction thereof. Travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed a horizontal distance of 100 feet.

Note: One 55-gallon open drum of water with two fire pails may be substituted for a fire extinguisher having a 2A rating.

(b) A 1/2-inch diameter garden-type hose line, not to exceed 100 feet in length and equipped with a nozzle, may be substituted for a 2A-rated fire extinguisher, provided it is capable of discharging a minimum of 5 gallons per minute with a minimum hose stream range of 30 feet horizontally. The garden-type hose lines shall be mounted on conventional racks or reels. The number and location of hose racks or reels shall be such that at least one hose stream can be applied to all points in the area.

(c) One or more fire extinguishers, rated not less than 2A, shall be provided on each floor. In multistory buildings, where combustibles are present, at least one fire extinguisher shall be located adjacent to a stairway.

(d) Extinguishers and water drums, subject to freezing, shall be protected from freezing.

(e) A fire extinguisher, rated not less than 10B, shall be provided within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas are being used on the jobsite. This requirement does not apply to the integral fuel tanks of motor vehicles.

(f) Carbon tetrachloride and other toxic vaporizing liquid fire extinguishers are prohibited.

(g) Portable fire extinguishers shall be inspected periodically and maintained in accordance with Maintenance and Use of Portable Fire Extinguishers, NFPA No. 10A-1981 and the general safety and health standards, chapter 296-24 WAC, Part G-3.

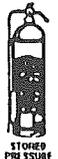
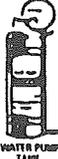
(h) Fire extinguishers which have been listed or approved by a nationally recognized testing laboratory, shall be used to meet the requirements of this part. (See Table D-1)

Table D-1

KNOW YOUR FIRE EXTINGUISHERS

	WATER TYPE				FOAM	CARBON DIOXIDE	DRY CHEMICAL		MULTI-PURPOSE ABC	
	STANDARD PRESSURE	CARTRIDGE OPERATED	WATER PUMP TANK	SODA ACID	FOAM	CO ₂	CARTRIDGE OPERATED	STORED PRESSURE	STORED PRESSURE	CARTRIDGE OPERATED
CLASS A FIRES BURNING SOLIDS LEAVING BLUING REMAINS 	YES	YES	YES	YES	YES	NO	NO	NO	YES	YES
CLASS B FIRES IN FLAMMABLE LIQUIDS, GASES, OILS, PAINTS, GREASE, ETC. 	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES
CLASS C FIRES ELECTRICAL EQUIPMENT 	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
CLASS D FIRES COMBUSTIBLE METALS 	SPECIAL EXTINGUISHING AGENTS APPROVED BY RECOGNIZED TESTING LABORATORIES									
METHOD OF OPERATION	PULL PIN - SHOULDER HANDLE	TURN UPSIDE DOWN AND SLAM	PUMP HANDLE	TURN UPSIDE DOWN	TURN UPSIDE DOWN	PULL PIN - SHOULDER LEVER	PULL PIN - SHOULDER LEVER	PULL PIN - SHOULDER HANDLE	PULL PIN - SHOULDER HANDLE	PULL PIN - SHOULDER LEVER
RANGE	30' - 40'	30' - 40'	30' - 40'	30' - 40'	30' - 40'	3' - 8'	5' - 20'	5' - 20'	5' - 20'	5' - 20'
MAINTENANCE	CHECK AIR PRESSURE GAUGE MONTHLY	WEIGH GAS CARTRIDGE - ADD WATER IF REQUIRED ANNUALLY	DISCHARGE AND FILL WITH WATER ANNUALLY	DISCHARGE ANNUALLY RECHARGE	DISCHARGE ANNUALLY RECHARGE	WEIGH SEMI ANNUALLY	WEIGH GAS CARTRIDGE - CHECK CONDITION OF DRY CHEMICAL ANNUALLY	CHECK PRESSURE GAUGE AND CONDITION OF DRY CHEMICAL ANNUALLY	CHECK PRESSURE GAUGE AND CONDITION OF DRY CHEMICAL ANNUALLY	WEIGH GAS CARTRIDGE - CHECK CONDITION OF DRY CHEMICAL ANNUALLY

KNOW YOUR FIRE EXTINGUISHERS

	WATER TYPE				FOAM	CARBON DIOXIDE	DRY CHEMICAL			
	 STORED PRESSURE	 CARTRIDGE OPERATED	 WATER PUMP TYPE	 SODA ACID			SODIUM OR POTASSIUM BICARBONATE		MULTI-PURPOSE ABC	
							 CARTRIDGE OPERATED	 STORED PRESSURE	 STORED PRESSURE	 CARTRIDGE OPERATED
CLASS A FIRES WOOD, PAPER, TRASH HAVING GLD WING EMBERS 	YES	YES	YES	YES	YES	NO <small>(WILL NOT CONTROL SMALL SURFACE FIRES)</small>	NO <small>(WILL NOT CONTROL SMALL SURFACE FIRES)</small>	NO <small>(WILL NOT CONTROL SMALL SURFACE FIRES)</small>	YES	YES
CLASS B FIRES FLAMMABLE LIQUIDS, GASOLINE, OIL, PAINTS, GREASE, ETC. 	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES
CLASS C FIRES ELECTRICAL EQUIPMENT 	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
CLASS D FIRES COMBUSTIBLE METALS 	SPECIAL EXTINGUISHING AGENTS APPROVED BY RECOGNIZED TESTING LABORATORIES									
METHODS OF OPERATION	PULL PIN - SQUEEZE LEVER	TURN UP SIDE DOWN AND PUMP	PUMP HANDLE	TURN UP SIDE DOWN	TURN UP SIDE DOWN	PULL PIN - SQUEEZE LEVER	RUPTURE CARTRIDGE SQUEEZE LEVER	PULL PIN - SQUEEZE HANDLE	PULL PIN - SQUEEZE HANDLE	RUPTURE CARTRIDGE SQUEEZE LEVER
RANGE	30' - 40'	30' - 40'	30' - 40'	30' - 40'	30' - 40'	3' - 8'	5' - 20'	5' - 20'	5' - 20'	5' - 20'
MAINTENANCE	CHEK AIR PRESSURE GAUGE MONTHLY	WEIGH GAS CARTRIDGE ADD WATER IF REQUIRED ANNUALLY	DISCHARGE AND FILL WITH WATER ANNUALLY	DISCHARGE ANNUALLY RECHARGE	DISCHARGE ANNUALLY RECHARGE	WEIGH SEEL ANNUALLY	WEIGH GAS CARTRIDGE CHEK CONDITION OF DRY CHEMICAL ANNUALLY	CHEK PRESSURE GAUGE AND CONDITION OF DRY CHEMICAL ANNUALLY	CHEK PRESSURE GAUGE AND CONDITION OF DRY CHEMICAL ANNUALLY	WEIGH GAS CARTRIDGE CHEK CONDITION OF DRY CHEMICAL ANNUALLY

Note: One hundred feet, or less, of 1-1/2 inch hose, with a nozzle capable of discharging water at 25 gallons or more per minute, may be substituted for a fire extinguisher rated not more than 2A in the designated area provided that the hose line can reach all points in the area.

(i) If fire hose connections are not compatible with local fire fighting equipment, the contractor shall provide adapters, or equivalent, to permit connections.

(j) During demolition involving combustible materials, charged hose lines, supplied by hydrants, water tank trucks with pumps, or equivalent, shall be made available.

(4) Fixed fire fighting equipment.

(a) Sprinkler protection.

(i) If the facility being constructed includes the installation of automatic sprinkler protection, the installation shall closely follow the construction and be placed in service as soon as applicable laws permit following completion of each story.

(ii) During demolition or alterations, existing automatic sprinkler installations shall be retained in service as long as reasonable. The operation of sprinkler control valves shall be permitted only by properly authorized persons.

Note: Modification of sprinkler systems to permit alterations or additional demolition should be expedited so that the automatic protection may be returned to service as quickly as possible. Sprinkler control valves shall be checked daily at close of work to ascertain that the protection is in service.

(b) Standpipes. In all structures in which standpipes are required, or where standpipes exist in structures being altered, they shall be brought up as soon as applicable laws permit, and shall be maintained as construction progresses in such a manner that they are always ready for fire protection use. The standpipes shall be provided with Siamese fire department connections on the outside of the structure, at the

street level, which shall be conspicuously marked. There shall be at least one standard hose outlet at each floor.

(5) Fire alarm devices.

(a) An alarm system, e.g., telephone system, siren, etc., shall be established by the employer whereby employees on the site and the local fire department can be alerted for an emergency.

(b) The alarm code and reporting instructions shall be conspicuously posted at phones and at employee entrances.

(6) Fire cutoffs.

(a) Fire walls and exit stairways, required for the completed buildings, shall be given construction priority. Fire doors, with automatic closing devices, shall be hung on openings as soon as practical.

(b) Fire cutoffs shall be retained in buildings undergoing alterations or demolition until operations necessitate their removal.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-260, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-260, filed 1/21/86; Order 76-6, § 296-155-260, filed 3/1/76; Order 74-26, § 296-155-260, filed 5/7/74, effective 6/6/74.]

Reviser's note: RCW 34.05.395 requires the use of underlining and deletion marks to indicate amendments to existing rules, and deems ineffectual changes not filed by the agency in this manner. The bracketed material in the above section does not appear to conform to the statutory requirement.

WAC 296-155-265 Fire prevention. (1) Ignition hazards.

(a) Electrical wiring and equipment for light, heat, or power purposes shall be installed in compliance with the requirements of Part I of this standard.

(b) Internal combustion engine powered equipment shall be so located that exhausts are well away from combustible materials. When exhausts are piped to outside the building

under construction, a clearance of at least 6 inches shall be maintained between such piping and combustible material.

(c) Smoking shall be prohibited at or in the vicinity of operations which constitute a fire hazard, and shall be conspicuously posted: "No smoking or open flame."

(d) Portable battery powered lighting equipment, used in connection with the storage, handling, or use of flammable gases or liquids, shall be of the type approved for the hazardous locations.

(e) The nozzle of air, inert gas, and steam lines or hoses, when used in the cleaning or ventilation of tanks and vessels that contain hazardous concentrations of flammable gases or vapors, shall be bonded to the tank or vessel shell. Bonding devices shall not be attached or detached in hazardous concentrations of flammable gases or vapors.

(f) Workers shall not take open lights or open flames near or in an open sewer manhole, gas main, conduit or other similar place until the absence of explosive or harmful gases has been assured. Open lights or flames shall not be carried into areas and enclosures where flammable vapors or exposed low flash point solvents exist. Only approved and suitable protected lights shall be used.

(2) Temporary buildings.

(a) No temporary building shall be erected where it will adversely affect any means of exit.

(b) Temporary buildings, when located within another building or structure, shall be of either noncombustible construction or of combustible construction having a fire resistance of not less than 1 hour.

(c) Temporary buildings, located other than inside another building and not used for the storage, handling, or use of flammable or combustible liquids, flammable gases, explosives, or blasting agents, or similar hazardous occupancies, shall be located at a distance of not less than 10 feet from another building or structure. Groups of temporary buildings, not exceeding 2,000 square feet in aggregate, shall, for the purpose of this part, be considered a single temporary building.

(3) Open yard storage.

(a) Combustible materials shall be piled with due regard to the stability of piles and in no case higher than 20 feet.

(b) Driveways between and around combustible storage piles shall be at least 15 feet wide and maintained free from accumulation of rubbish, equipment, or other articles or materials. Driveways shall be so spaced that a maximum grid system unit of 50 feet by 150 feet is produced.

(c) The entire storage site shall be kept free from accumulation of unnecessary combustible materials. Weeds and grass shall be kept down and a regular procedure provided for the periodic cleanup of the entire area.

(d) When there is a danger of an underground fire, that land shall not be used for combustible or flammable storage.

(e) Method of piling shall be solid wherever possible and in orderly and regular piles. No combustible material shall be stored outdoors within 10 feet of a building or structure.

(f) Portable fire extinguishing equipment, suitable for the fire hazard involved, shall be provided at convenient, conspicuously accessible locations in the yard area. Portable fire extinguishers, rated not less than 2A, shall be placed so that

maximum travel distance to the nearest unit shall not exceed 100 feet.

(4) Indoor storage.

(a) Storage shall not obstruct, or adversely affect, means of exit.

(b) All materials shall be stored, handled, and piled with due regard to their fire characteristics.

(c) Noncompatible materials, which may create a fire hazard, shall be segregated by a barrier having a fire resistance of at least 1 hour.

(d) Material shall be piled to minimize the spread of fire internally and to permit convenient access for firefighting. Stable piling shall be maintained at all times. Aisle space shall be maintained to safely accommodate the widest vehicle that may be used within the building for fire-fighting purposes.

(e) Clearance of at least 36 inches shall be maintained between the top level of the stored material and the sprinkler deflectors.

(f) Clearance shall be maintained around lights and heating units to prevent ignition of combustible materials.

(g) A clearance of 24 inches shall be maintained around the path of travel of fire doors unless a barricade is provided, in which case no clearance is needed. Material shall not be stored within 36 inches of a fire door opening.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-155-265, filed 11/14/88; Order 74-26, § 296-155-265, filed 5/7/74, effective 6/6/74.]

WAC 296-155-270 Flammable and combustible liquids. (1) General requirements.

(a) Only approved containers and portable tanks shall be used for storage and handling of flammable and combustible liquids. Approved metal safety cans shall be used for the handling and use of flammable liquids in quantities greater than one gallon, except that this shall not apply to those flammable liquid materials which are highly viscid highly (extremely hard to pour), which may be used and handled in original shipping containers. For quantities of one gallon or less, only the original container or approved metal safety cans shall be used for storage, use, and handling of flammable liquids.

(b) Flammable or combustible liquids shall not be stored in areas used for exits, stairways, or normally used for the safe passage of people.

(c) Flammable and combustible liquid containers shall be legibly marked to indicate their contents. Each storage container for flammable or combustible liquids, with a capacity of 50 gallons or more, shall have the contents of the container identified by a sign of clearly visible contrasting colors with letters at least 3 inches high, painted on the container at the discharge valve and at the fill point.

(d) Gasoline shall not be used as a solvent or a cleaning agent.

(2) Indoor storage of flammable and combustible liquids.

(a) No more than 25 gallons of flammable or combustible liquids shall be stored in a room outside of an approved storage cabinet. For storage of liquid petroleum gas, see WAC 296-155-275.

(b) Quantities of flammable and combustible liquid in excess of 25 gallons shall be stored in an acceptable or approved cabinet meeting the following requirements:

(i) Acceptable wooden storage cabinets shall be constructed in the following manner, or equivalent: The bottom, sides, and top shall be constructed of an exterior grade of plywood at least 1 inch in thickness, which shall not break down or delaminate under standard fire test conditions. All joints shall be rabbeted and shall be fastened in two directions with flathead wood screws, when more than one door is used, there shall be a rabbeted overlap of not less than 1 inch. Steel hinges shall be mounted in such a manner as to not lose their holding capacity due to loosening or burning out of the screws when subjected to fire. Such cabinets shall be painted inside and out with fire retardant paint.

(ii) Approved metal storage cabinets will be acceptable.

(iii) Cabinets shall be labeled in conspicuous lettering, "Flammable—Keep fire away."

(c) Not more than 60 gallons of flammable or 120 gallons of combustible liquids shall be stored in any one storage cabinet. Not more than three such cabinets may be located in a single storage area. Quantities in excess of this shall be stored in an inside storage room.

(d)(i) Inside storage room shall be constructed to meet the required fire-resistive rating for their use. Such construction shall comply with the test specifications set forth in Standard Methods of Fire Test of Building Construction and Material, NFPA 251-1972.

(ii) Where an automatic extinguishing system is provided, the system shall be designed and installed in an approved manner. Openings to other rooms or buildings shall be provided with noncombustible liquid-tight raised sills or ramps at least 4 inches in height, or the floor in the storage area shall be at least 4 inches below the surrounding floor. Openings shall be provided with approved self-closing fire doors. The room shall be liquid-tight where the walls join the floor. A permissible alternate to the sill or ramp is an open-grated trench, inside of the room, which drains to a safe location. Where other portions of the building or other buildings are exposed, windows shall be protected as set forth in the Standard for Fire Doors and Windows, NFPA No. 80-1983, for Class E or F openings. Wood of at least 1-inch nominal thickness may be used for shelving, racks, dunnage, scuffboards, floor overlay and similar installations.

(iii) Materials which will react with water and create a fire hazard shall not be stored in the same room with flammable or combustible liquids.

(iv) Storage in inside storage rooms shall comply with Table D-2 following:

TABLE D-2

Fire protection provided	Fire resistance	Maximum size	Total allowable quantities gals./sq. ft./floor area
Yes	2 hrs.	500 sq. ft.	10
No	2 hrs.	500 sq. ft.	4
Yes	1 hr.	150 sq. ft.	5
No	1 hr.	150 sq. ft.	2

Note: Fire protection system shall be sprinkler, water spray, carbon dioxide or other system approved by a nationally recognized testing laboratory for this purpose.

(v) Electrical wiring and equipment located in inside storage rooms shall be approved for Class 1, Division 1, haz-

ardous locations. For definition of Class 1, Division 1, hazardous locations, see WAC 296-155-456.

(vi) Every inside storage room shall be provided with either a gravity or a mechanical exhausting system. Such system shall commence not more than 12 inches above the floor and be designed to provide for a complete change of air within the room at least 6 times per hour. If a mechanical exhausting system is used, it shall be controlled by a switch located outside of the door. The ventilating equipment and any lighting fixtures shall be operated by the same switch. An electric pilot light shall be installed adjacent to the switch if flammable liquids are dispensed within the room. Where gravity ventilation is provided, the fresh air intake, as well as the exhausting outlet from the room, shall be on the exterior of the building in which the room is located.

(vii) In every inside storage room there shall be maintained one clear aisle at least 3 feet wide. Containers over 30 gallons capacity shall not be stacked one upon the other.

(viii) Flammable and combustible liquids in excess of that permitted in inside storage rooms shall be stored outside of buildings in accordance with subsection (3) of this section.

(3) Storage outside buildings.

(a) Storage of containers (not more than 60 gallons each) shall not exceed 1,100 gallons in any one pile or area. Piles or groups of containers shall be separated by a 5-foot clearance. Piles or groups of containers shall not be nearer than 20 feet to a building.

(b) Within 200 feet of each pile of containers, there shall be a 12-foot-wide access way to permit approach of fire control apparatus.

(c) The storage area shall be graded in a manner to divert possible spills away from buildings or other exposures, or shall be surrounded by a curb or earth dike at least 12 inches high. When curbs or dikes are used, provisions shall be made for draining off accumulations of ground or rain water, or spills of flammable or combustible liquids. Drains shall terminate at a safe location and shall be accessible to operation under fire conditions.

(d) Outdoor portable tank storage.

(i) Portable tanks shall not be nearer than 20 feet from any building. Two or more portable tanks, grouped together, having a combined capacity in excess of 2,200 gallons, shall be separated by a 5-foot-clear area. Individual portable tanks exceeding 1,100 gallons shall be separated by a 5-foot-clear area.

(ii) Within 200 feet of each portable tank, there shall be a 12-foot-wide access way to permit approach of fire control apparatus.

(e) Storage areas shall be kept free of weeds, debris, and other combustible material not necessary to the storage.

(f) Portable tanks, not exceeding 660 gallons, shall be provided with emergency venting and other devices, as required by chapters III and IV of NFPA 30-1972, The Flammable and Combustible Liquids Code.

(g) Portable tanks, in excess of 660 gallons, shall have emergency venting and other devices, as required by chapters II and III of the Flammable and Combustible Liquids Code, NFPA 30-1972.

(4) Fire control for flammable or combustible liquid storage.

(a) At least one portable fire extinguisher, having a rating of not less than 20-B units, shall be located outside of, but not more than 10 feet from, the door opening into any room used for storage of more than 60 gallons of flammable or combustible liquids.

(b) At least one portable fire extinguisher having a rating of not less than 20-B units shall be located not less than 25 feet, nor more than 75 feet, from any flammable liquid storage area located outside.

(c) When sprinklers are provided, they shall be installed in accordance with the Standard for the Installation of Sprinkler Systems, NFPA 13-1972.

(d) At least one portable fire extinguisher having a rating of not less than 20-B:C units shall be provided on all tank trucks or other vehicles used for transporting and/or dispensing flammable or combustible liquids.

(5) Dispensing liquids.

(a) Areas in which flammable or combustible liquids are transferred at the same time, in quantities greater than 5 gallons from one tank or container to another tank or container, shall be separated from other operations by 25-foot distance or by construction having a fire-resistance of at least 1 hour. Drainage or other means shall be provided to control spills. Adequate natural or mechanical ventilation shall be provided to maintain the concentration of flammable vapor at or below 10 percent of the lower flammable limit.

(b) Transfer flammable liquids from one container to another shall be done only when containers are electrically interconnected (bonded).

(c) Flammable or combustible liquids shall be drawn from or transferred into vessels, containers, or tanks within a building or outside only through a closed piping system, from safety cans, by means of a device drawing through the top, or from a container, or portable tanks, by gravity or pump, through an approved self-closing valve. Transferring by means of air pressure on the container or portable tank is prohibited.

(d) The dispensing units shall be protected against collision damage.

(e) Dispensing devices and nozzles for flammable liquids shall be of an approved type, as required by WAC 296-24-33015.

(6) Handling liquids at point of final use.

(a) Flammable liquids shall be kept in closed containers when not actually in use.

(b) Leakage or spillage of flammable or combustible liquids shall be disposed of promptly and safely.

(c) Flammable liquids shall be used only where there are no open flames or other sources of ignition within 50 feet of the operation, unless conditions warrant greater clearance.

(7) Service and refueling areas.

(a) Flammable or combustible liquids shall be stored in approved closed containers, in tanks located underground, or in aboveground portable tanks.

(b) The tank trucks shall comply with the requirements covered in the Standard for Tank Vehicles for Flammable and Combustible Liquids, NFPA No. 385-1977.

(c) The dispensing hose shall be an approved type.

(d) The dispensing nozzle shall be an approved automatic-closing type.

(e) Underground tanks shall not be abandoned.

(f) Clearly identified and easily accessible switch(es) shall be provided at a location remote from dispensing devices to shut off the power to all dispensing devices in the event of an emergency.

(g)(i) Heating equipment of an approved type may be installed in the lubrication or service area where there is no dispensing or transferring of flammable liquids, provided the bottom of the heating unit is at least 18 inches above the floor and is protected from physical damage.

(ii) Heating equipment installed in lubrication or service areas, where flammable liquids are dispensed, shall be of an approved type for garages, and shall be installed at least 8 feet above the floor.

(h) There shall be no smoking or open flames in the areas used for fueling, servicing fuel systems for internal combustion engines, receiving or dispensing of flammable or combustible liquids.

(i) Conspicuous and legible signs prohibiting smoking shall be posted.

(j) The motor of any equipment being fueled shall be shut off during the fueling operation.

(k) Each service or fueling area shall be provided with at least one fire extinguisher having a rating of not less than 20BC located so that an extinguisher will be within 75 feet of each pump, dispenser, underground fill pipe opening, and lubrication or service area.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-155-270, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-270, filed 1/21/86; Order 74-26, § 296-155-270, filed 5/7/74, effective 6/6/74.]

WAC 296-155-275 Liquefied petroleum gas (LP-gas).

(1) Approval of equipment and systems.

(a) Each system shall have containers, valves, connectors, manifold valve assemblies, and regulators of an approved type.

(b) All cylinders shall meet the department of transportation specification identification requirements published in 49 CFR Part 178, Shipping Container Specifications.

(2) Welding on LP-gas containers. Welding is prohibited on containers.

(3) Container valves and container accessories.

(a) Valves, fittings, and accessories connected directly to the container, including primary shut off valves, shall have a rated working pressure of at least 250 p.s.i.g. and shall be of material and design suitable for LP-gas service.

(b) Connections to containers, except safety relief connections, liquid level gauging devices, and plugged openings, shall have shutoff valves located as close to the container as practicable.

(4) Safety devices.

(a) Every container and every vaporizer shall be provided with one or more approved safety relief valves or devices. These valves shall be arranged to afford free vent to the outer air with discharge not less than 5 feet horizontally away from any opening into a building which is below such discharge.

(b) Shutoff valves shall not be installed between the safety relief device and the container, or the equipment or piping to which the safety relief device is connected, except

that a shutoff valve may be used where the arrangement of this valve is such that full required capacity flow through the safety relief device is always afforded.

(c) Container safety relief devices and regulator relief vents shall be located not less than 5 feet in any direction from air openings into sealed combustion system appliances or mechanical ventilation air intakes.

(5) Dispensing.

(a) Filling of fuel containers for trucks or motor vehicles from bulk storage containers shall be performed not less than 10 feet from the nearest masonry-walled building, or not less than 25 feet from the nearest building or other construction and, in any event, not less than 25 feet from any building opening.

(b) Filling of portable containers or containers mounted on skids from storage containers shall be performed not less than 50 feet from the nearest building.

(6) Requirements for appliances.

(a) LP-gas consuming appliances shall be approved types.

(b) Any appliance that was originally manufactured for operation with a gaseous fuel other than LP-gas, and is in good condition, may be used with LP-gas only after it is properly converted, adapted, and tested for performance with LP-gas before the appliance is placed in use.

(7) Containers and regulating equipment installed outside of buildings or structures. Containers shall be upright upon firm foundations or otherwise firmly secured. The possible effect on the outlet piping of settling shall be guarded against by a flexible connection or special fitting.

(8) Containers and equipment used inside of buildings or structures.

(a) When operational requirements make portable use of containers necessary, and their location outside of buildings or structures is impractical, containers and equipment are permitted to be used inside of buildings or structures in accordance with (b) through (k) of this subsection. In addition, there may be provisions of this section that are applicable to the particular use or occupancy.

(b) "Containers in use" means connected for use.

(c) Systems utilizing containers having a water capacity greater than 2 1/2-pounds (nominal 1 pound LP-gas capacity) shall be equipped with excess flow valves. Such excess flow valves shall be either integral with the container valves or in the connections to the container valve outlets.

(d) Regulators, when required, shall be either directly connected to the container valves or to manifolds connected to the container valves. The regulator shall be suitable for use with LP-gas. Manifolds and fittings connecting containers to pressure regulator inlets shall be designed for at least 250 p.s.i.g. service pressure.

(e) Valves on containers having water capacity greater than 50 pounds (nominal 20 pounds LP-gas capacity) shall be protected from damage while in use or storage.

(f) Aluminum piping or tubing shall not be used.

(g) Hose shall be designed for a working pressure of at least 250 p.s.i.g. Design, construction, and performance of hose, and hose connections shall have their suitability determined by listing by a nationally recognized testing agency. The hose length shall be as short as practical. Hoses shall be

long enough to permit compliance with spacing provisions of (a) through (m) of this subsection, without kinking or straining, or causing hose to be so close to a burner as to be damaged by heat.

(h) Portable heaters, including salamanders, shall be equipped with an approved automatic device to shut off the flow of gas to the mainburner, and pilot if used, in the event of flame failure. Such heaters, having inputs above 50,000 BTU per hour, shall be equipped with either a pilot, which must be lighted and proved before the main burner can be turned on, or an electrical ignition system.

Note: The provisions of this subdivision do not apply to portable heaters under 7,500 BTU per hour input when used with containers having a maximum water capacity of 2 1/2 pounds.

(i) Container valves, connectors, regulators, manifolds, piping, and tubing shall not be used as structural supports for heaters.

(j) Containers, regulating equipment, manifolds, pipe, tubing, and hose shall be located to minimize exposure to high temperatures or physical damage.

(k) Containers having a water capacity greater than 2 1/2 pounds (nominal 1 pound LP-gas capacity) connected for use shall stand on a firm and substantially level surface and, when necessary, shall be secured in an upright position.

(l) The maximum water capacity of individual containers shall be 245 pounds (nominal 100 pounds LP-gas capacity).

(m) For temporary heating, heaters (other than integral heater-container units) shall be located at least 6 feet from any LP-gas container. This shall not prohibit the use of heaters specifically designed for attachment to the container or to a supporting standard, provided they are designed and installed so as to prevent direct or radiant heat application from the heater onto the containers. Blower and radiant type heaters shall not be directed toward any LP-gas container within 20 feet.

(n) If two or more heater-container units, of either the integral or nonintegral type, are located in an unpartitioned area on the same floor, the container or containers of each unit shall be separated from the container or containers of any other unit by at least 20 feet.

(o) When heaters are connected to containers for use in an unpartitioned area on the same floor, the total water capacity of containers, manifolded together for connection to a heater or heaters, shall not be greater than 735 pounds (nominal 300 pounds LP-gas capacity). Such manifolds shall be separated by at least 20 feet.

(p) Storage of containers awaiting use shall be in accordance with subsections (10) and (11) of this section.

(9) Multiple container systems.

(a) Valves in the assembly of multiple container systems shall be arranged so that replacement of containers can be made without shutting off the flow of gas in the system. This provision is not to be construed as requiring an automatic changeover device.

(b) Heaters shall be equipped with an approved regulator in the supply line between the fuel cylinder and the heater unit. Cylinder connectors shall be provided with an excess flow valve to minimize the flow of gas in the event the fuel line becomes ruptured.

(c) Regulators and low-pressure relief devices shall be rigidly attached to the cylinder valves, cylinders, supporting standards, the building walls, or otherwise rigidly secured, and shall be so installed or protected from the elements.

(10) Storage of LPG containers. Storage of LPG within building is prohibited.

(11) Storage outside of buildings.

(a) Storage outside of buildings, for containers awaiting use, shall be located from the nearest building or group of buildings, in accordance with Table D-3:

TABLE D-3

Quantity of LP-gas stored:	Distance (feet)
500 lbs. or less	0
501 to 6,000 lbs.	10
6,001 to 10,000 lbs.	20
Over 10,000 lbs.	25

(b) Containers shall be in a suitable ventilated enclosure or otherwise protected against tampering, or possible damage by vehicular traffic.

(12) Fire protection. Storage locations shall be provided with at least one approved portable fire extinguisher having a rating of not less than 20-B:C.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-275, filed 1/21/86; Order 76-29, § 296-155-275, filed 9/30/76; Order 74-26, § 296-155-275, filed 5/7/74, effective 6/6/74.]

WAC 296-155-280 Temporary heating devices. (1) Ventilation.

(a) Fresh air shall be supplied in sufficient quantities to maintain the health and safety of workers. Where natural means of fresh air supply is inadequate, mechanical ventilation shall be provided.

(b) When heaters are used in confined spaces, special care shall be taken to provide sufficient ventilation in order to ensure proper combustion, maintain the health and safety of workers, and limit temperature rise in the area.

(2) Clearance and mounting.

(a) Temporary heating devices shall be installed to provide clearance to combustible material not less than the amount shown in Table D-4.

(b) Temporary heating devices, which are listed for installation with lesser clearances than specified in Table D-4, may be installed in accordance with their approval.

TABLE D-4

Heating appliances	Minimum clearance, (inches)		
	Sides	Rear	Chimney connector
Room heater, circulating type	12	12	18
Room heater, radiant type	36	36	18

(c) Heaters not suitable for use on wood floors shall not be set directly upon them or other combustible materials. When such heaters are used, they shall rest on suitable heat insulating material or at least 1-inch concrete, or equivalent. The insulating material shall extend beyond the heater 2 feet or more in all directions.

(d) Heaters used in the vicinity of combustible tarpaulins, canvas, or similar coverings shall be located at least 10 feet from the coverings. The coverings shall be securely fastened to prevent ignition or upsetting of the heater due to wind action on the covering or other material.

(3) Stability. Heaters, when in use, shall be set horizontally level, unless otherwise permitted by the manufacturer's markings.

(4) Oil-fired heaters.

(a) Flammable liquid-fired heaters shall be equipped with a primary safety control to stop the flow of fuel in the event of flame failure. Barometric or gravity oil feed shall not be considered a primary safety control.

(b) Heaters designed for barometric or gravity oil feed shall be used only with the integral tanks.

(c) Heaters specifically designed and approved for use with separate supply tanks may be directly connected for gravity feed, or an automatic pump, from a supply tank.

(5) Salamanders.

(a) Coverage. The use of solid fuel salamanders is prohibited in buildings and on scaffolds.

(b) General requirements.

(i) All solid fuel salamanders shall be designed and constructed for use with solid fuel, that is, coal or coke.

(ii) Solid fuel salamanders shall be equipped with a cover designed as part of the unit, to prevent spillage of burning material in case of tipover.

(iii) Salamanders shall be assembled in accordance with the instructions issued by the manufacturer.

(iv) The safeguards engineered into the product shall be maintained and any replacement shall be equivalent thereto.

(v) Salamanders shall be stored in such a manner as to prevent deterioration or damage to the unit.

(c) Operation.

(i) Manufacturers' instructions shall be followed by the user.

(ii) Each time a salamander is placed in operation it shall be checked to insure that it is functioning properly. Its operation shall be checked periodically thereafter.

(iii) When concentrations of carbon monoxide attain quantities greater than 35 parts per million (0.0035 percent) to air volume at employee breathing levels, the salamander shall be extinguished unless additional natural or mechanical ventilation is provided to reduce the carbon monoxide content to permissible limits.

(iv) Tests for presence of carbon monoxide shall be made by a qualified person within 1 hour after the start of each shift and at least every 3 hours thereafter. If concentrations of carbon monoxide reach 20 parts per million to air volume, tests shall be made more frequently to determine if there is a continuing increase of carbon monoxide concentration.

(v) Records of all tests including the date, time, results obtained, and person making tests, shall be maintained for the duration of the project.

(vi) No persons shall be permitted to be within the area being heated by the salamanders except under the following circumstances: When tending the salamanders; when testing the atmosphere; or in emergency situations.

(vii) No employee shall be permitted to enter the heated area until notification is given to another person located outside. Periodic checks shall be made to ensure the health and safety of employees entering the heated area.

(viii) When a salamander is being used, the responsibility for its operation and maintenance shall be assigned to a qualified employee.

(ix) Salamanders shall not be moved, handled, or serviced while hot or burning, or while component parts are hot to the touch.

(x) Salamanders, when in use, shall be set level with the horizontal unless otherwise permitted by the manufacturer's markings. Salamanders shall be designed so as not to tip over when placed on a surface inclined 25° to the horizontal.

(xi) If equivalent protection and safety is afforded by alternative design, the 25° limitation may be reduced.

(xii) Salamanders not suitable for use on wood floors shall not be set directly upon them or other combustible materials. When such salamanders are used they shall rest on suitable insulating material or at least 1-inch concrete or equivalent. The insulating material shall extend beyond the salamander 2 feet or more in all directions.

(xiii) Salamanders used in the vicinity of tarpaulins, canvas, or similar coverings shall be located a safe distance from coverings and other combustible materials. The coverings shall be securely fastened to prevent ignition of the covering or upsetting of the salamanders due to wind action on the covering or other material.

(xiv) Salamanders in use shall be protected to prevent flame extinguishment.

(d) Ventilation.

(i) Fresh air shall be supplied in sufficient quantities to maintain the health and safety of employees. Where natural means for fresh air supply is inadequate, mechanical ventilation shall be provided. Particular attention shall be given to confined spaces and pockets where heat and fumes may accumulate and employees may be present (roof areas, peaks, basement).

(ii) When salamanders are used in confined spaces, special care shall be taken to provide sufficient ventilation in order to assure proper combustion, maintain the health and safety of employees, and limit temperature rise in the area.

(e) Fueling.

(i) Salamanders shall be refueled only by a person trained in such operations.

(ii) Only a 1 day's supply of heater fuel shall be stored inside a building in the vicinity of the salamander. General fuel storage shall be outside the structure.

(iii) All fuel storage shall be maintained a minimum of 25 feet from source of ignition.

(f) Maintenance.

(i) The user shall comply with the maintenance instructions as provided by the manufacturer.

(ii) Equipment showing evidence of deterioration or damage that constitutes a safety or health hazard shall be removed from service.

(iii) Salamander repairs shall be performed in accordance with the manufacturer's recommendations, and replacement parts shall be equal to, the equivalent of, or the same as the original salamander equipment.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-280, filed 7/20/94, effective 9/20/94; Order 76-29, § 296-155-280, filed 9/30/76; Order 74-26, § 296-155-280, filed 5/7/74, effective 6/6/74.]

PART E SIGNS, SIGNALS, AND BARRICADES

WAC 296-155-300 Accident prevention signs and tags. (1) General. Signs and symbols required by this section shall be visible at all times when work is being performed, and shall be removed or covered promptly when the hazards no longer exist.

(2) Danger signs.

(a) Danger signs (see Figure E-1) shall be used only where an immediate hazard exists.

(b) Danger signs shall have red as the predominating color for the upper panel; black outline on the borders; and a white lower panel for additional sign wording.

(3) Caution signs.

(a) Caution signs (see Figure E-2) shall be used only to warn against potential hazards or to caution against unsafe practices.

(b) Caution signs shall have yellow as the predominating color; black upper panel and borders; yellow lettering of "caution" on the black panel; and the lower yellow panel for additional sign wording.



FIGURE E-1

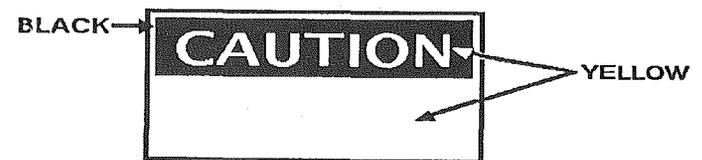


FIGURE E-2

(4) Exit signs.

(a) Every exit sign shall have the word "exit" in plainly legible letters not less than 6 inches high, with the principal strokes of letters not less than three-fourths-inch wide.

(b) Every exit sign shall be distinctive in color and shall provide contrast with decorations, interior finish, or other signs.

(5) Safety instruction signs. Safety instruction signs, when used, shall be white with green upper panel with white letters to convey the principal message. Any additional wording on the sign shall be black letters on the white background.

(6) Directional signs. Directional signs, other than automotive traffic signs specified in subsection (7) of this section, shall be white with a black panel and a white directional symbol. Any additional wording on the sign shall be black letters on the white background.

(7) Traffic signs.

(a) Construction areas shall be posted with legible traffic signs at points of hazard.

(b) All traffic control signs or devices used for protection of construction workers shall conform to and be set up according to American National Standards Institute D6.1-1988, Manual on Uniform Traffic Control Devices for Streets and Highways as amended by the Washington state department of transportation (M24-OT (HT)).

(8) Accident prevention tags.

(a) Accident prevention tags shall be used as a temporary means of warning employees of an existing hazard, such as defective tools, equipment, etc. They shall not be used in place of, or as a substitute for, accident prevention signs.

(b) Specifications for accident prevention tags similar to those in Table E-1 shall apply.

(i) Additional rules. American National Standards Institute (ANSI) Z35.1-1972, Specifications for Accident Prevention signs, and Z35.2-1968, Specifications for Accident Prevention Tags, contain rules which are additional to the rules prescribed in this section. The employer shall comply with ANSI Z35.1-1972 and Z35.2-1968 with respect to rules not specifically prescribed in this part.

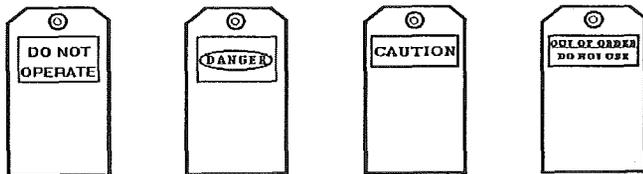


TABLE E-1

White tag- White letters on red square	White tag- White letters on red oval with a black square	Yellow tag- Yellow letters on a black background	White tag- White letters on black background
Basic Stock (Background)	Safety Colors (Ink)	Copy Specification (Letters)	
White	Red	Do Not Operate	
White	Black and Red	Danger	
Yellow	Black	Caution	
White	Black	Out of Order-Do Not Use	

[Statutory Authority: Chapter 49.17 RCW. 93-19-142 (Order 93-04), § 296-155-300, filed 9/22/93, effective 11/1/93; 93-01-067 (Order 92-15), § 296-155-300, filed 12/11/92, effective 1/15/93. Statutory Authority: RCW

49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-300, filed 1/21/86; Order 74-26, § 296-155-300, filed 5/7/74, effective 6/6/74.]

WAC 296-155-305 Signaling. Flaggers.

(1) When operations are such that signs, signals, and barricades do not provide the necessary protection on or adjacent to a highway or street, flaggers or other appropriate traffic controls shall be provided.

(2) Signaling directions by flaggers shall conform to American National Standards Institute D6.1-1988, Manual on Uniform Traffic Control Devices for Streets and Highways, as amended by the Washington state department of transportation. (M24-01 (HT).)

(3) Hand signaling by flaggers shall be by use of sign paddles at least 18 inches in diameter with series "C" letters at least 6 inches high or lights approved by the transportation commission. When hand signaling is done in periods of darkness, the sign paddles must be reflectorized or illuminated as required by ANSI D6.1-1988, Manual on Uniform Traffic Control Devices. The "STOP" side of the paddle shall have a red background with white lettering. When a paddle has a "SLOW" side, the background shall be orange and the lettering black. Colors shall conform to ANSI D6.1 current edition.

(4) Flaggers shall wear an orange warning garment and a yellow protective helmet while flagging. Warning garments worn at night shall be of reflectorized material. Yellow is specified as the color of helmets; the issue is clearly one of high visibility. Other colors providing equal visibility than the specified yellow will be acceptable. The iridescent or reflectorized hard hats, available in several colors, which provide "high visibility" in both day and night applications, will meet standard specifications.

(5) Each flagger shall be trained every three years in accordance with the American National Standards Institute (ANSI) D6.1-1988 Manual on Uniform Traffic Control Devices as amended by the Washington state department of transportation (M 24-01 (HT)).

Note: Personnel that have not completed a flagging course may be assigned duties as flaggers only during emergencies when a sudden, generally unexpected, set of circumstances demands immediate attention.

(6) Each flagger shall have in their possession a valid certificate which verifies completion of the training prescribed in subsection (5) of this section. Each certificate shall contain the date the card expires.

[Statutory Authority: Chapter 49.17 RCW. 93-19-142 (Order 93-04), § 296-155-305, filed 9/22/93, effective 11/1/93; 93-01-067 (Order 92-15), § 296-155-305, filed 12/11/92, effective 1/15/93; 89-11-035 (Order 89-03), § 296-155-305, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-305, filed 1/21/86; Order 76-6, § 296-155-305, filed 3/1/76; Order 74-26, § 296-155-305, filed 5/7/74, effective 6/6/74.]

WAC 296-155-310 Barricades. Barricades for protection of employees shall conform to the portions of the American National Standards Institute D6.1-1988, Manual on Uniform Traffic Control Devices for Streets and Highways, as amended by the Washington state department of highways, (M24-01 (HT)), relating to barricades.

[Statutory Authority: Chapter 49.17 RCW. 93-19-142 (Order 93-04), § 296-155-310, filed 9/22/93, effective 11/1/93; Order 74-26, § 296-155-310, filed 5/7/74, effective 6/6/74.]

WAC 296-155-315 Definitions applicable to this part.

(1) "Barricade" means an obstruction to deter the passage of persons or vehicles.

(2) "Signs" are the warnings of hazard, temporarily or permanently affixed or placed, at locations where hazards exist.

(3) "Signals" are moving signs, provided by workers, such as flagger, or by devices, such as flashing lights, to warn of possible or existing hazards.

(4) "Tags" are temporary signs, usually attached to a piece of equipment or part of a structure, to warn of existing or immediate hazards.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-315, filed 7/20/94, effective 9/20/94; Order 76-6, § 296-155-315, filed 3/1/76.]

**PART F
MATERIAL HANDLING, STORAGE, USE AND
DISPOSAL**

WAC 296-155-325 General requirements for storage.

(1) General.

(a) All materials stored in tiers shall be stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling or collapse.

(b) Maximum safe load limits of floors within buildings and structures, in pounds per square foot, shall be conspicuously posted in all storage areas, except for floor or slab on grade. Maximum safe loads shall not be exceeded.

(c) Aisles and passageways shall be kept clear to provide for the free and safe movement of material handling equipment or employees. Such areas shall be kept in good repair.

(d) When a difference in road or working levels exist, means such as ramps, blocking, or grading shall be used to ensure the safe movement of vehicles between the two levels.

(2) Material storage.

(a)(i) Material stored inside buildings under construction shall not be placed within 6 feet of any hoistway or inside floor openings, nor within 10 feet of an exterior wall which does not extend above the top of the material stored.

(ii) Temporary floors, used in steel erection, concrete forms and shoring (i.e., stripped forms, shoring jacks, clamps, steel rods or pipes, base plates, etc.) placed within close proximity to an open-sided floor for movement to another tier for placement, shall be considered "in-process equipment and subject to the provisions contained in Parts "O" and "P" of this standard. When this type equipment is to be left overnight or for longer periods of time it shall be anchored and braced to prevent displacement in any direction. In addition this equipment shall be subject to the provisions of this subsection while in "interim storage."

(b) Each employee required to work on stored material in silos, hoppers, tanks, and similar storage areas shall be equipped with personal fall arrest equipment meeting the requirements of chapter 296-155 WAC, Part C-1.

(c) Noncompatible materials shall be segregated in storage.

(d) Bagged materials shall be stacked by stepping back the layers and cross-keying the bags at least every 10 bags high.

(i) When cement and lime is delivered in paper bags they shall be carefully handled to prevent the bags bursting.

(ii) Cement and lime bags shall not be piled more than ten bags high except when stored in bins or enclosures built for the purpose of storage.

(iii) When bags are removed from the pile, the length of the pile shall be kept at an even height, and the necessary step backs every five bags maintained.

(iv) Persons handling cement and lime bags shall wear eye protection which prevents contact between the substance and the worker's eyes (such as goggles or other sealed eye protection) and shall wear long sleeve shirts with close fitting collar and cuffs.

(v) Persons shall be warned against wearing clothing that has become hard and stiff with cement.

(vi) Persons shall be instructed to report any susceptibility of their skin to cement and lime burns.

(vii) A hand cream or vaseline and eye wash shall be provided and kept ready for use to prevent burns.

(viii) Lime shall be stored in a dry place to prevent a premature slacking action that may cause fire.

(e) Materials shall not be stored on scaffolds or runways in excess of supplies needed for immediate operations.

(f) Brick stacks shall not be more than 7 feet in height. When a loose brick stack reaches a height of 4 feet, it shall be tapered back 2 inches in every foot of height above the 4-foot level.

(i) Brick shall never be stacked, for storage purposes, on scaffolds or runways.

(ii) When delivering brick on scaffolds inside the wall lines in wheelbarrows, they shall be dumped toward the inside of the building and not toward the wall.

(iii) Blocks shall always be stacked and not thrown in a loose pile.

(g) When masonry blocks are stacked higher than 6 feet, the stack shall be tapered back one-half block per tier above the 6-foot level.

(i) When blocks are stacked inside a building, the piles shall be so distributed as not to overload the floor on which they stand.

(ii) Blocks shall not be dropped or thrown from an elevation or delivered through chutes.

(h) Lumber:

(i) Used lumber shall have all nails withdrawn before stacking.

(ii) Lumber shall be stacked on level and solidly supported sills.

(iii) Lumber shall be so stacked as to be stable and self-supporting.

(iv) Lumber stacks shall not exceed 20 feet in height provided that lumber to be handled manually shall not be stacked more than 16 feet high.

(v) All stored lumber shall be stacked on timber sills to keep it off the ground. Sills shall be placed level on solid supports.

(vi) Cross strips shall be placed in the stacks when they are stacked more than four feet high.

(i) Structural steel, poles, pipe, bar stock, and other cylindrical materials, unless racked, shall be stacked and blocked so as to prevent spreading or tilting.

(i) Persons handling reinforcing steel shall wear heavy gloves.

(ii) When bending of reinforcing steel is done on the job, a strong bench shall be provided, set up on even dry ground or a floor for the persons to work on.

(iii) Structural steel shall be carefully piled to prevent danger of members rolling off or the pile toppling over.

(iv) Structural steel shall be kept in low piles, consideration being given to the sequence of use of the members.

(v) Corrugated and flat iron shall be stacked in flat piles, with the piles not more than four feet high and spacing strips shall be placed between each bundle.

(j) Sand, gravel and crushed stone.

(i) Stock piles shall be frequently inspected to prevent their becoming unsafe by continued adding to or withdrawing from the stock.

(ii) If material becomes frozen, it shall not be removed in a manner that would produce an overhang.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-325, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-325, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-325, filed 1/21/86; Order 74-26, § 296-155-325, filed 5/7/74, effective 6/6/74.]

WAC 296-155-329 Qualified person—Rigging. Qualified person - A person who, by possession of a recognized degree or certificate of professional standing, or who, by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter.

Also has authorization or authority by the nature of their position to take prompt corrective measures to eliminate them. The person shall be knowledgeable in the requirements of this part.

[Recodified as § 296-155-329, filed 8/4/98, effective 8/4/98. Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-13-069, § 296-155-229, filed 6/15/98, effective 8/15/98.]

WAC 296-155-330 Rigging equipment for material handling. (1) General.

(a) Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to ensure that it is safe. Defective rigging equipment shall be removed from service.

(b) Rigging equipment shall not be loaded in excess of its recommended safe working load, as prescribed in Tables F-1 through F-20 in this part and shall comply with ANSI/ASME B30.9-1996.

(c) Rigging equipment, when not in use, shall be removed from the immediate work area so as not to present a hazard to employees.

(d) Special rigging accessories (i.e., spreader bars, grabs, hooks, clamps, etc.) or other lifting accessories shall be marked with the rated capacity. All components shall be proof-tested to 125 percent of the rated load prior to the first use. Permanent records shall be maintained on the job site for all special rigging accessories.

(2) Alloy steel chains. Chains used for overhead lifting shall be proof tested alloy steel.

(1999 Ed.)

(a) Welded alloy steel chain slings shall have permanently affixed durable identification stating size, grade, rated capacity, and sling manufacturer.

(b) Hooks, rings, oblong links, pear-shaped links, welded or mechanical coupling links, or other attachments, when used with alloy steel chains, shall have a rated capacity at least equal to that of the chain.

(c) The use of job or shop hooks and links, or makeshift fasteners, formed from bolts, rods, etc., or other such attachments, shall be prohibited.

(d) Rated capacity (working load limit) for alloy steel chain slings shall conform to the values shown in Table F-1.

(e) Whenever wear at any point of any chain link exceeds that shown in Table F-2, the assembly shall be removed from service.

(f) If at any time any three foot length of chain is found to have stretched one-third the length of a link it shall be discarded.

(g) The practice of placing bolts, nails, or cold shuts between two links to shorten chains is prohibited.

(h) Splicing broken chains by inserting a bolt between two links with the heads of the bolt and the nut sustaining the load, or passing one link through another and inserting a bolt or nail to hold it, is prohibited.

(i) Wherever annealing of chains is attempted, it shall be done in properly equipped annealing furnaces and under the direct supervision of a competent person.

(3) Wire rope.

(a) Table F-3 through F-14 shall be used to determine the safe working loads of various sizes and classifications of improved plow steel wire rope and wire rope slings with various types of terminals. For sizes, classifications, and grades not included in these tables, the safe working load recommended by the manufacturer for specific, identifiable products shall be followed, provided that a safety factor of not less than 5 is maintained.

(b) Protruding ends of strands in splices on slings and bridles shall be covered or blunted.

(c) Wire rope shall not be secured by knots.

(d) The following limitations shall apply to the use of wire rope:

(i) An eye splice made in any wire rope shall have not less than three full tucks.

Note: This requirement shall not preclude the use of another form of splice or connection which can be shown to be as efficient and which is not otherwise prohibited.

(ii) Except for eye splices in the ends of wires and for endless rope slings, each wire rope used in hoisting or lowering, or in pulling loads, shall consist of one continuous piece without knot or splice.

(iii) Wire rope shall not be used, if in any length of eight diameters, the total number of visible broken wires exceeds 10 percent of the total number of wires, or if the rope shows other signs of excessive wear, corrosion, or defect.

(e) When U-bolt wire rope clips are used to form eyes, Table F-20 shall be used to determine the number and spacing of clips.

(f) When used for eye splices, the U-bolt shall be applied so that the "U" section is in contact with the dead end of the rope.

[Title 296 WAC—p. 2177]

(g) U-Bolt wire rope clips shall be made of drop-forged steel.

Note: See Table F-20 for number of clamps and spacing requirements.

CORRECT METHOD OF ATTACHING WIRE ROPE CLIPS



U-Bolt of all clips on dead end of rope

(h) Slings shall not be shortened with knots or bolts or other makeshift devices.

(i) Thimbles shall be used in cable eyes whenever practicable.

(j) The clamp nuts shall be tightened up frequently during the operation to prevent slipping.

(4) Natural rope, and synthetic fiber.

(a) General. When using natural or synthetic fiber rope slings, Tables F-15, F-16, F-17 and F-18 shall apply.

(b) All splices in rope slings provided by the employer shall be made in accordance with fiber rope manufacturers' recommendations.

(i) In manila rope, eye splices shall contain at least three full tucks, and short splices shall contain at least six full tucks (three on each side of the centerline of the splice).

(ii) In layed synthetic fiber rope, eye splices shall contain at least four full tucks, and short splices shall contain at least eight full tucks (four on each side of the centerline of the splice).

(iii) Strand end tails shall not be trimmed short (flush with the surface of the rope) immediately adjacent to the full tucks. This precaution applies to both eye and short splices and all types of fiber rope. For fiber ropes under 1-inch diameter, the tails shall project at least six rope diameters beyond the last full tuck. For fiber ropes 1-inch diameter and larger, the tails shall project at least 6 inches beyond the last full tuck. In applications where the projecting tails may be objectionable, the tails shall be tapered and spliced into the body of the rope using at least two additional tucks (which will require a tail length of approximately six rope diameters beyond the last full tuck).

(iv) For all eye splices, the eye shall be sufficiently large to provide an included angle of not greater than 60° at the splice when the eye is placed over the load or support.

(v) Knots shall not be used in lieu of splices.

(vi) All fibre rope used for hoisting purposes or for the support of scaffolds, or any part thereof, shall be of high grade Manila hemp (abaca). Fibre rope used for the support of scaffolds, or any part thereof, except rope used for lashing or tying purposes, shall be not less than 3/4-inch in diameter.

(vii) The maximum safe working load for fibre rope shall not exceed the maximum strength as shown in the following table:

**STRENGTH OF HIGH GRADE MANILA (ABACA) ROPE
COMMON LAY THREE STRAND**

Approximate Diameter in inches	Circumference in inches	Safe Load in Pounds
3/16 (6 yarns)	1/2	98
1/4 (6 yarns)	3/4	116
5/16 (6 yarns)	1	200
3/8 (12 yarns)	1 1/8	241
7/16 (15 yarns)	1 1/4	291
15/32 (18 yarns)	1 3/8	350
1/2 (21 yarns)	1 1/2	408
9/16	1 3/4	526
5/8	2	666
3/4	2 1/4	816
13/16	2 1/2	983
7/8	2 3/4	1,166
1	3	1,366
1 1/16	3 1/4	1,683
1 1/8	3 1/2	1,833
1 1/4	3 3/4	2,083
1 5/16	4	2,365
1 3/8	4 1/4	2,666
1 1/2	4 1/2	2,916

Note: This table is based on data contained in the U.S. Department of Commerce circular of the Bureau of Standards, No. 324.

(5) Synthetic webbing (nylon, polyester, and polypropylene).

(a) The employer shall have each synthetic web sling marked or coded to show:

- (i) Name or trademark of manufacturer.
- (ii) Rated capacities for the type of hitch.
- (iii) Type of material.

(b) Rated capacity shall not be exceeded.

(6) Shackles and hooks.

(a) Table F-19 shall be used to determine the safe working loads of various sizes of shackles, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products, provided that a safety factor of not less than 5 is maintained.

(b) The manufacturer's recommendations shall be followed in determining the safe working loads of the various sizes and types of specific and identifiable hooks. All hooks for which no applicable manufacturer's recommendations are available shall be tested to twice the intended safe working load before they are initially put into use. The employer shall maintain a record of the dates and results of such tests.

(c) Hooks shall not be modified by welding and/or drilling unless written approval by the manufacturer has been received.

(d) No open hook shall be used to hoist a bucket, cage, spreader, or skip, nor in any circumstances where the dislodgment of the hook could cause a risk of injury to workers. A safety-hook, mousing, or shackle shall be employed in such circumstances.

(e) When shackles are used, shackle pins shall be secured to prevent accidental withdrawal.

(7) Slings.

(a) When slings are provided as a part of the hoisting equipment, every precaution shall be taken to keep them in a serviceable condition.

(i) Wire rope slings shall be frequently inspected and oiled.

(ii) Slings shall not be left where they can be damaged by traffic or form stumbling hazards.

(iii) Blocks or heavy bagging shall be used at corners of the load to protect the sling from sharp bending.

(iv) Wire rope which has been welded or been subject to welding of any kind shall not be used.

(v) The wire rope shall not be burned off with heat. This may weld the ends of the wires and strands together.

(b) When a load is lifted by a multiple rope sling the sling shall be so arranged that the strain can be equalized between the ropes.

(i) When using a sling with both ends engaged in the hoisting block, the sling shall be adjusted so as to equalize the stress.

(ii) Slings shall be placed on the load at safe lifting angles.

(8) Material handling—General.

(a) When necessary to store building material on public thoroughfares, care shall be exercised to see that it is so piled or stacked as to be safe against collapse or falling over.

(b) Material shall be so located as not to interfere with, or present a hazard to employees, traffic or the public.

(9) Placing and removal of forms.

(a) When moved or raised by crane, cableway, A-frame, or similar mechanical device, forms shall be securely attached to slings having a minimum safety factor of five. Use of No. 9 tie wire, fiber rope, and similar makeshift lashing shall be prohibited.

(b) Taglines shall be used in moving panels or other large sections of forms by crane or hoist.

(c) All hoisting equipment, including hoisting cable used to raise and move forms shall have a minimum safety factor incorporated in the manufacturer's design, and the manufacturer's recommended loading shall not be exceeded. Field-fabricated or shop-fabricated hoisting equipment shall be designed or approved by a registered professional engineer, incorporating a minimum safety factor of five in its design. Panels and built-up form sections shall be equipped with metal hoisting brackets for attachment of slings.

(10) Precast concrete and tilt-up operations.

(a) It shall be the responsibility of the contractor to use accessories which are designed to be compatible.

(b) The design capacity of all lifting devices and accessories shall be known. The devices and accessories with the appropriate capacity shall be used.

(c) Prior to pouring the panels of a tilt-up type construction job, a set of plans or job specifications, including lifting procedures, shall be drawn up.

(i) These plans shall be at the job site and made available upon request.

(ii) Any changes made in the rigging procedure of a tilt-up panel or slab shall provide the same degree of safety as required by the original plans.

(iii) The plans or specifications shall contain the following information:

(A) The type, size, and location of all lifting inserts.

(B) The type, size, and location of all brace inserts or fittings for guy wires in each panel and floor or support.

(C) The size of braces or guys to be used.

(D) The compression strength which concrete panels must attain prior to being lifted.

(iv) The following conditions shall be included in the erection process and shall be incorporated in the design plan:

(A) Inserts to be installed for lifting sections of tilt-up precast panels shall be designed mechanically to maintain a safety factor of three.

(B) Lifting inserts which are embedded or otherwise attached to precast concrete members, other than the tilt-up members, shall be capable of supporting at least four times the maximum intended load applied or transmitted to them.

(C) The compression strength of the concrete shall be such that when the proper type, size, and amount of inserts are installed a minimum safety factor of two will be maintained.

(v) Lifting hardware shall be capable of supporting at least five times the maximum intended load applied or transmitted to the lifting hardware.

(vi) Lifting bolts or other lifting devices which have been bent, worn, or are otherwise defective shall be discarded.

(vii) Manufactured products shall not be altered in a manner which would reduce the safe working load to less than its original value.

(viii) Inserts shall be positioned so that bolts, or lifting devices, when inserted, will be perpendicular to the face on which they are placed.

(d) Design of the panels and layout of the pour shall be made in such a manner so that when picking, the top of the panel will be away from the crane. If this is not possible, the contractor shall consult with a representative of the department and the crane company involved to determine the procedure to be followed in lifting and placing in its permanent position safely. Panels shall be lifted and handled in such a manner that they will not strike the hoisting equipment, in case of failure.

(e) A qualified rigging person shall be designated and shall consult with the crane operator on lifting procedures prior to making the pick. The qualified rigging person shall be located in such a position during the pick of the panel that they can observe both the crane operator and the employees working in the immediate area.

(11) Rigging in prestressed and post tensioned.

(a) Stressed members shall be handled at pick points specifically designated on the manufacturer's drawings.

(b) Stressed members shall be lifted with lifting devices recommended by the manufacturer or the engineer in charge.

(c) No one shall be allowed under stressed members during lifting and erection.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-13-069, § 296-155-330, filed 6/15/98, effective 8/15/98. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-330, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-330, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.150, and 49.17.240. 79-08-115 (Order 79-9), § 296-155-330, filed 7/31/79; Order 76-29, § 296-155-330, filed 9/30/76; Order 74-26, § 296-155-330, filed 5/7/74, effective 6/6/74.]

WAC 296-155-335 Disposal of waste materials. (1) Whenever materials are dropped more than 20 feet to any point lying outside the exterior walls of the building, an

enclosed chute of wood, or equivalent material, shall be used. For the purpose of this subsection, an enclosed chute is a slide, closed in on all sides, through which material is moved from a high place to a lower one.

(2) When debris is dropped without the use of chutes, the area onto which the material is dropped shall be completely enclosed with barricades not less than 42 inches high and not less than 20 feet back from the projected edge of the opening above. Signs warning of the hazard of falling materials shall be posted at each level. Removal shall not be permitted in this lower area until debris handling ceases above.

(3) All scrap lumber, waste material, and rubbish shall be removed from the immediate work area as the work progresses.

(4) Disposal of waste material or debris by burning shall comply with local fire regulations.

(5) All solvent waste, oily rags, and flammable liquids shall be kept in fire resistant covered containers until removed from the worksite.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-335, filed 1/21/86; Order 74-26, § 296-155-335, filed 5/7/74, effective 6/6/74.]

WAC 296-155-34901 Table F-1.

TABLE F-1

RATED CAPACITY (WORKING LOAD LIMIT),
FOR ALLOY STEEL CHAIN SLINGS*
RATED CAPACITY
(WORKING LOAD LIMIT), POUNDS

TABLE F-1: PART 1—Double Slings

Chain Size, Inches	Single Branch Sling - 90 degrees Loading	Double Sling Vertical Angle ¹		
		30 degree	45 degree	60 degree
		Horizontal Angle ²		
		60 degree	45 degree	30 degree
1/4	3,250	5,560	4,550	3,250
3/8	6,600	11,400	9,300	6,600
1/2	11,250	19,500	15,900	11,250
5/8	16,500	28,500	23,300	16,500
3/4	23,000	39,800	32,500	23,000
7/8	28,750	49,800	40,600	28,750
1	38,750	67,100	54,800	38,750
1-1/8	44,500	77,000	63,000	44,500
1-1/4	57,500	99,500	81,000	57,500
1-3/8	67,000	116,000	94,000	67,000
1-1/2	80,000	138,000	112,500	80,000
1-3/4	100,000	172,000	140,000	100,000

TABLE F-1: PART 2—Triple and Quadruple Slings

Chain Size, Inches	Single Branch Sling - 90 degrees Loading	Triple and Quadruple Sling Vertical Angle ¹		
		30 degree	45 degree	60 degree
		Horizontal Angle ²		
		60 degree	45 degree	30 degree
1/4	3,250	8,400	6,800	4,900
3/8	6,600	17,000	14,000	9,900
1/2	11,250	29,000	24,000	17,000
5/8	16,000	43,000	35,000	24,500
3/4	23,000	59,500	48,500	34,500
7/8	28,750	74,500	61,000	43,000
1	38,750	101,000	82,000	58,000
1-1/8	44,500	115,500	94,500	66,500
1-1/4	57,500	149,000	121,500	86,000
1-3/8	67,000	174,000	141,000	100,500
1-1/2	80,000	207,000	169,000	119,500
1-3/4	100,000	258,000	210,000	150,000

¹ Rating of multileg slings adjusted for angle of loading measured as the included angle between the inclined leg and the vertical.

² Rating of multileg slings adjusted for angle of loading between the inclined leg and the horizontal plane of the load.

* Other grades of proof tested steel chain include proof coil, BBB coil and hi-test chain. These grades are not recommended for overhead lifting and therefore are not covered by this standard.

[Order 74-26, § 296-155-335 (part), Table F-1 (codified as WAC 296-155-34901), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34902 Table F-2.

TABLE F-2

MAXIMUM ALLOWABLE WEAR AT ANY POINT OF LINK

Chain Size (inches)	Maximum Allowable Wear (inch)
1/4	3/64
3/8	5/64
1/2	7/64
5/8	9/64
3/4	5/32
7/8	11/64
1	3/16
1 1/8	7/32
1 1/4	1/4
1 3/8	9/32
1 1/2	5/16
1 3/4	11/32

[Order 74-26, § 296-155-335 (part), Table F-2 (codified as WAC 296-155-34902), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34903 Table F-3.

TABLE F-3

RATED CAPACITIES FOR SINGLE LEG SLINGS
6 x 19 and 6 x 37 CLASSIFICATION
IMPROVED PLOW STEEL GRADE ROPE
WITH FIBER CORE (FC)

Rope Dia. (Inches)	Constr.	Rated Capacities, Tons (2,000 lb)								
		Vertical			Choker			Vertical Basket*		
		HT	MS	S	HT	MS	S	HT	MS	S
1/4	6x19	0.49	0.51	0.55	0.37	0.38	0.41	0.99	1.0	1.1
5/16	6x19	0.76	0.79	0.85	0.57	0.59	0.64	1.5	1.6	1.7
3/8	6x19	1.1	1.1	1.2	0.80	0.85	0.91	2.1	2.2	2.4
7/16	6x19	1.4	1.5	1.6	1.1	1.1	1.2	2.9	3.0	3.3

TABLE F-3

RATED CAPACITIES FOR SINGLE LEG SLINGS
6 x 19 and 6 x 37 CLASSIFICATION
IMPROVED PLOW STEEL GRADE ROPE
WITH FIBER CORE (FC)

		1.8	2.0	2.1	1.4	1.5	1.6	3.7	3.9	4.3
1/2	6x19	1.8	2.0	2.1	1.4	1.5	1.6	3.7	3.9	4.3
9/16	6x19	2.3	2.5	2.7	1.7	1.9	2.0	4.6	5.0	5.4
5/8	6x19	2.8	3.1	3.3	2.1	2.3	2.5	5.6	6.2	6.7
3/4	6x19	3.9	4.4	4.8	2.9	3.3	3.6	7.8	8.8	9.5
7/8	6x19	5.1	5.9	6.4	3.9	4.5	4.8	10.0	12.0	13.0
1	6x19	6.7	7.7	8.4	5.0	5.8	6.3	13.0	15.0	17.0
1 - 1/8	6x19	8.4	9.5	10.0	6.3	7.1	7.9	17.0	19.0	21.0
1 - 1/4	6x37	9.8	11.0	12.0	7.4	8.3	9.2	20.0	22.0	25.0
1 - 3/8	6x37	12.0	13.0	15.0	8.9	10.0	11.0	24.0	27.0	30.0
1 - 1/2	6x37	14.0	16.0	17.0	10.0	12.0	13.0	28.0	32.0	35.0
1 - 5/8	6x37	16.0	18.0	21.0	12.0	14.0	15.0	33.0	37.0	41.0
1 - 3/4	6x37	19.0	21.0	24.0	14.0	16.0	18.0	38.0	43.0	48.0
2	6x37	25.0	28.0	31.0	18.0	21.0	23.0	49.0	55.0	62.0

HT = Hand tucked splice and hidden tuck splice. For hidden tuck splice (IWRC) use value in HT column.

MS = Mechanical splice.

S = Swaged or zinc poured socket.

* These values only apply when the D/d ratio for HT slings is 10 or greater, and for MS and S slings is 20 or greater where:

D = Diameter of curvature around which the body of the sling is bent.

d = Diameter of rope.

[Order 74-26, § 296-155-335 (part), Table F-3 (codified as WAC 296-155-34903), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34904 Table F-4.

TABLE F-4

RATED CAPACITIES FOR SINGLE LEG SLINGS
6 x 19 and 6 x 37 CLASSIFICATION
IMPROVED PLOW STEEL GRADE ROPE
WITH INDEPENDENT WIRE ROPE CORE (IWRC)

Rope		Rated Capacities, Tons (2,000 lb.)								
Dia. (Inches)	Constr.	Vertical			Choker			Vertical Basket*		
		HT	MS	S	HT	MS	S	HT	MS	S
1/4	6x19	0.53	0.56	0.59	0.40	0.42	0.44	1.0	1.1	1.2
5/16	6x19	0.81	0.87	0.92	0.61	0.65	0.69	1.6	1.7	1.8
3/8	6x19	1.1	1.2	1.3	0.86	0.93	0.98	2.3	2.5	2.6
7/16	6x19	1.5	1.7	1.8	1.2	1.3	1.3	3.1	3.4	3.5
1/2	6x19	2.0	2.2	2.3	1.5	1.6	1.7	3.9	4.4	4.6
9/16	6x19	2.5	2.7	2.9	1.8	2.1	2.2	4.9	5.5	5.8
5/8	6x19	3.0	3.4	3.6	2.2	2.5	2.7	6.0	6.8	7.2
3/4	6x19	4.2	4.9	5.1	3.1	3.6	3.8	8.4	9.7	10.0
7/8	6x19	5.5	6.6	6.9	4.1	4.9	5.2	11.0	13.0	14.0
1	6x19	7.2	8.5	9.0	5.4	6.4	6.7	14.0	17.0	18.0
1 - 1/8	6x19	9.0	10.0	11.0	6.8	7.8	8.5	18.0	21.0	23.0
1 - 1/4	6x37	10.0	12.0	13.0	7.9	9.2	9.9	21.0	24.0	26.0
1 - 3/8	6x37	13.0	15.0	16.0	9.6	11.0	12.0	25.0	29.0	32.0
1 - 1/2	6x37	15.0	17.0	19.0	11.0	13.0	14.0	30.0	35.0	38.0
1 - 5/8	6x37	18.0	20.0	22.0	13.0	15.0	17.0	35.0	41.0	44.0
1 - 3/4	6x37	20.0	24.0	26.0	15.0	18.0	19.0	41.0	47.0	51.0
2	6x37	26.0	30.0	33.0	20.0	23.0	25.0	53.0	61.0	66.0

HT = Hand tucked splice. For hidden tuck splice (IWRC) use Table F3 values in HT column.

MS = Mechanical splice.

S = Swaged or zinc poured socket.

* These values only apply when the D/d ratio for HT slings is 10 or greater, and for MS and S slings is 20 or greater where:

D = Diameter of curvature around which the body of the sling is bent.

d = Diameter of rope.

[Order 74-26, § 296-155-335 (part), Table F-4 (codified as WAC 296-155-34904), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34905 Table F-5.

TABLE F-5

RATED CAPACITIES FOR SINGLE LEG SLINGS
CABLE LAND ROPE -
MECHANICAL SPLICE ONLY
7 x 7 x 7 & 7 x 7 x 19 CONSTRUCTIONS
GALVANIZED AIRCRAFT GRADE ROPE
7 x 6 x 19 IWRC CONSTRUCTION
IMPROVED PLOW STEEL GRADE ROPE

Rope		Rated Capacities, Tons (2,000 lb)			
Dia. (Inches)	Constr.	Vertical	Choker	Vertical Basket*	
1/4	7x7x7	0.50	0.38	1.0	
3/8	7x7x7	1.1	.81	2.2	
1/2	7x7x7	1.8	1.4	3.7	
5/8	7x7x7	2.8	2.1	5.5	
3/4	7x7x7	3.8	2.9	7.6	
5/8	7x7x19	2.9	2.2	5.8	
3/4	7x7x19	4.1	3.0	8.1	
7/8	7x7x19	5.4	4.0	11.0	
1	7x7x19	6.9	5.1	14.0	
1-1/8	7x7x19	8.2	6.2	16.0	
1-1/4	7x7x19	9.9	7.4	20.0	
3/4	7x6x19 IWRC	3.8	2.8	7.6	
7/8	7x6x19 IWRC	5.0	3.8	10.0	
1	7x6x19 IWRC	6.4	4.8	13.0	
1-1/8	7x6x19 IWRC	7.7	5.8	15.0	
1-1/4	7x6x19 IWRC	9.2	6.9	18.0	
1-5/16	7x6x19 IWRC	10.0	7.5	20.0	
1-3/8	7x6x19 IWRC	11.0	8.2	22.0	
1-1/2	7x6x19 IWRC	13.0	9.6	26.0	

* These values only apply when the D/d ratio is 10 or greater where:

D = Diameter of curvature around which the body of the sling is bent.

d = Diameter of rope.

[Order 74-26, § 296-155-335 (part), Table F-5 (codified as WAC 296-155-34905), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34906 Table F-6.

TABLE F-6

RATED CAPACITIES FOR SINGLE LEG SLINGS 8-PART AND 6-PART BRAIDED ROPE 6 x 7 AND 6 x 19 CONSTRUCTION IMPROVED PLOW STEEL GRADE ROPE 7 x 7 CONSTRUCTION GALVANIZED AIRCRAFT GRADE ROPE

Component Ropes		Rated Capacities, Tons (2,000 lb)					
Diameter (inches)	Constr.	Vertical		Choker		Basket Vertical to 30 degrees*	
		8-Part	6-Part	8-Part	6-Part	8-Part	6-Part
3/32	6 x 7	0.42	0.32	0.32	0.24	0.74	0.55
1/8	6 x 7	0.76	0.57	0.57	0.42	1.3	0.98
3/16	6 x 7	1.7	1.3	1.3	0.94	2.9	2.2
3/32	7 x 7	0.51	0.39	0.38	0.29	0.89	0.67
1/8	7 x 7	0.95	0.71	0.71	0.53	1.6	1.2
3/16	7 x 7	2.1	1.5	1.5	1.2	3.6	2.7
3/16	6 x 19	1.7	1.3	1.3	0.98	3.0	2.2
1/4	6 x 19	3.1	2.3	2.3	1.7	5.3	4.0
5/16	6 x 19	4.8	3.6	3.6	2.7	8.3	6.2
3/8	6 x 19	6.8	5.1	5.1	3.8	12.0	8.9
7/16	6 x 19	9.3	6.9	6.9	5.2	16.0	12.0
1/2	6 x 19	12.0	9.0	9.0	6.7	21.0	15.0
9/16	6 x 19	15.0	11.0	11.0	8.5	26.0	20.0
5/8	6 x 19	19.0	14.0	14.0	10.0	32.0	24.0
3/4	6 x 19	27.0	20.0	20.0	15.0	46.0	35.0
7/8	6 x 19	36.0	27.0	27.0	20.0	62.0	47.0
1	6 x 19	47.0	35.0	35.0	26.0	81.0	61.0

* These values only apply when the D/d ratio is 20 or greater where:
 D = Diameter of curvature around which the body of the sling is bent.
 d = Diameter of component rope.

[Order 74-26, § 296-155-335 (part), Table F-6 (codified as WAC 296-155-34906), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34907 Table F-7.

TABLE F-7

RATED CAPACITIES FOR 2-LEG & 3-LEG BRIDLE SLINGS
 6 x 19 AND 6 x 37 CLASSIFICATION
 IMPROVED PLOW STEEL GRADE ROPE
 WITH FIBER CORE (FC)

TABLE F-7: PART 1—2-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)					
		2-Leg Bridle Slings					
Dia. (Inches)	Constr.	Vert 30 degree		45 degree		Vert 60 degree	
		Horz 60 degree		Angle		Horz 30 degree	
		HT	MS	HT	MS	HT	MS
1/4	6 x 19	0.85	0.88	0.70	0.72	0.49	0.51
5/16	6 x 19	1.3	1.4	1.1	1.1	0.76	0.79
3/8	6 x 19	1.8	1.9	1.5	1.6	1.1	1.1
7/16	6 x 19	2.5	2.6	2.0	2.2	1.4	1.5
1/2	6 x 19	3.2	3.4	2.6	2.8	1.8	2.0
9/16	6 x 19	4.0	4.3	3.2	3.5	2.3	2.5
5/8	6 x 19	4.8	5.3	4.0	4.4	2.8	3.1
3/4	6 x 19	6.8	7.6	5.5	6.2	3.9	4.4
7/8	6 x 19	8.9	10.0	7.3	8.4	5.1	5.9
1	6 x 19	11.0	13.0	9.4	11.0	6.7	7.7
1- 1/8	6 x 19	14.0	16.0	12.0	13.0	8.4	9.5
1- 1/4	6 x 37	17.0	19.0	14.0	16.0	9.8	11.0
1- 3/8	6 x 37	20.0	23.0	17.0	19.0	12.0	13.0
1- 1/2	6 x 37	24.0	27.0	20.0	22.0	14.0	16.0
1- 5/8	6 x 37	28.0	32.0	23.0	26.0	16.0	18.0
1- 3/4	6 x 37	33.0	37.0	27.0	30.0	19.0	21.0
2	6 x 37	43.0	48.0	35.0	39.0	25.0	28.0

HT = Hand tucked splice.
 MS = Mechanical splice.

TABLE F-7: PART 2—3-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)					
		3-Leg Bridle Slings					
Dia. (Inches)	Constr.	Vert 30 degree		45 degree		Vert 60 degree	
		Horz 60 degree		Angle		Horz 30 degree	
		HT	MS	HT	MS	HT	MS
1/4	6 x 19	1.3	1.3	1.0	1.1	0.74	0.7
5/16	6 x 19	2.0	2.0	1.6	1.7	1.1	1.2
3/8	6 x 19	2.8	2.9	2.3	2.4	1.6	1.7
7/16	6 x 19	3.7	4.0	3.0	3.2	2.1	2.3
1/2	6 x 19	4.8	5.1	3.9	4.2	2.8	3.0
9/16	6 x 19	6.0	6.5	4.9	5.3	3.4	3.7
5/8	6 x 19	7.3	8.0	5.9	6.5	4.2	4.6
3/4	6 x 19	10.0	11.0	8.3	9.3	5.8	6.6
7/8	6 x 19	13.0	15.0	11.0	13.0	7.7	8.9
1	6 x 19	17.0	20.0	14.0	16.0	10.0	11.0
1- 1/8	6 x 19	22.0	24.0	18.0	20.0	13.0	14.0
1- 1/4	6 x 37	25.0	29.0	21.0	23.0	15.0	17.0
1- 3/8	6 x 37	31.0	35.0	25.0	28.0	18.0	20.0
1- 1/2	6 x 37	36.0	41.0	30.0	33.0	21.0	24.0
1- 5/8	6 x 37	43.0	48.0	35.0	39.0	25.0	28.0
1- 3/4	6 x 37	49.0	56.0	40.0	45.0	28.0	32.0
2	6 x 37	64.0	72.0	52.0	59.0	37.0	41.0

[Title 296 WAC—p. 2182]

HT = Hand tucked splice.
 MS = Mechanical splice.

[Order 74-26, § 296-155-335 (part), Table F-7 (codified as WAC 296-155-34907), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34908 Table F-8.

TABLE F-8

RATED CAPACITIES FOR 2-LEG & 3-LEG BRIDLE SLINGS
 6 x 19 AND 6 x 37 CLASSIFICATION
 IMPROVED PLOW STEEL GRADE ROPE
 WITH INDEPENDENT WIRE
 ROPE CORE (IWRC)

TABLE F-8: PART 1—2-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)					
		2-Leg Bridle Slings					
Dia. (Inches)	Constr.	Vert 30 degree		45 degree		Vert 60 degree	
		Horz 60 degree		Angle		Horz 30 degree	
		HT	MS	HT	MS	HT	MS
1/4	6 x 19	0.92	0.97	0.75	0.79	0.53	0.56
5/16	6 x 19	1.4	1.5	1.1	1.2	1.81	0.87
3/8	6 x 19	2.0	2.1	1.6	1.8	1.1	1.2
7/16	6 x 19	2.7	2.9	2.2	2.4	1.5	1.7
1/2	6 x 19	3.4	3.8	2.8	3.1	2.0	2.2
9/16	6 x 19	4.3	4.8	3.5	3.9	2.5	2.7
5/8	6 x 19	5.2	5.9	4.2	4.8	3.0	3.4
3/4	6 x 19	7.3	8.4	5.9	6.9	4.2	4.9
7/8	6 x 19	9.6	11.0	7.8	9.3	5.5	6.6
1	6 x 19	12.0	15.0	10.0	12.0	7.2	8.5
1- 1/8	6 x 19	16.0	18.0	13.0	15.0	9.0	10.0
1- 1/4	6 x 37	18.0	21.0	15.0	17.0	10.0	12.0
1- 3/8	6 x 37	22.0	25.0	18.0	21.0	13.0	15.0
1- 1/2	6 x 37	26.0	30.0	21.0	25.0	15.0	17.0
1- 5/8	6 x 37	31.0	35.0	25.0	29.0	18.0	20.0
1- 3/4	6 x 37	35.0	41.0	29.0	33.0	20.0	24.0
2	6 x 37	46.0	53.0	37.0	43.0	26.0	30.0

HT = Hand tucked splice.
 MS = Mechanical splice.

TABLE F-8: PART 2—3-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)					
		3-Leg Bridle Slings					
Dia. (Inches)	Constr.	Vert 30 degree		45 degree		Vert 60 degree	
		Horz 60 degree		Angle		Horz 30 degree	
		HT	MS	HT	MS	HT	MS
1/4	6 x 19	1.4	1.4	1.1	1.2	0.79	0.84
5/16	6 x 19	2.1	2.3	1.7	1.8	1.2	1.3
3/8	6 x 19	3.0	3.2	2.4	2.6	1.7	1.9
7/16	6 x 19	4.0	4.4	3.3	3.6	2.3	2.5
1/2	6 x 19	5.1	5.7	4.2	4.6	3.0	3.3
9/16	6 x 19	6.4	7.1	5.2	5.8	3.7	4.1
5/8	6 x 19	7.8	8.8	6.4	7.2	4.5	5.1
3/4	6 x 19	11.0	13.0	8.9	10.0	6.3	7.3
7/8	6 x 19	14.0	17.0	12.0	14.0	8.3	9.9
1	6 x 19	19.0	22.0	15.0	18.0	11.0	13.0
1- 1/8	6 x 19	23.0	27.0	19.0	22.0	13.0	16.0
1- 1/4	6 x 37	27.0	32.0	22.0	26.0	16.0	18.0
1- 3/8	6 x 37	33.0	38.0	27.0	31.0	19.0	22.0
1- 1/2	6 x 37	39.0	45.0	32.0	37.0	23.0	26.0
1- 5/8	6 x 37	46.0	53.0	38.0	43.0	27.0	31.0

(1999 Ed.)

Rope		Rated Capacities, Tons (2,000 lb)					
		3-Leg Bridle Slings					
Dia. (Inches)	Constr.	Vert 30 degree		45 degree		Vert 60 degree	
		Horz 60 degree	Angle	Horz 60 degree	Angle	Horz 30 degree	Angle
		HT	MS	HT	MS	HT	MS
1- 3/4	6 x 37	53.0	61.0	43.0	50.0	31.0	35.0
2	6 x 37	68.0	79.0	56.0	65.0	40.0	46.0

HT = Hand tucked splice
MS = Mechanical splice

[Order 74-26, § 296-155-335 (part), Table F-8 (codified as WAC 296-155-34908), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34909 Table F-9.

TABLE F-9

RATED CAPACITIES FOR 2-LEG AND 3-LEG BRIDLE SLINGS CABLE LAID ROPE - MECHANICAL SPLICE ONLY
7 x 7 x 7 AND 7 x 7 x 19 CONSTRUCTIONS
GALVANIZED AIRCRAFT GRADE ROPE
7 x 6 x 19 IWRC CONSTRUCTION IMPROVED
PLOW STEEL GRADE ROPE

TABLE F-9: PART 1—2-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)		
		2-Leg Bridle Sling		
Dia. (Inches)	Constr.	Vert 30 deg	45 degree	Vert 60 deg
		Horz 60 deg	Angle	Horz 30 deg
1/4	7 x 7 x 7	0.87	0.71	0.50
3/8	7 x 7 x 7	1.9	1.5	1.1
1/2	7 x 7 x 7	3.2	2.6	1.8
5/8	7 x 7 x 7	4.8	3.9	2.8
3/4	7 x 7 x 7	6.6	5.4	3.8
5/8	7 x 7 x 19	5.0	4.1	2.9
3/4	7 x 7 x 19	7.0	5.7	4.1
7/8	7 x 7 x 19	9.3	7.6	5.4
1	7 x 7 x 19	12.0	9.7	6.9
1- 1/8	7 x 7 x 19	14.0	12.0	8.2
1- 1/4	7 x 7 x 19	17.0	14.0	9.9
3/4	7 x 6 x 19 IWRC	6.6	5.4	3.8
7/8	7 x 6 x 19 IWRC	8.7	7.1	5.0
1	7 x 6 x 19 IWRC	11.0	9.0	6.4
1- 1/8	7 x 6 x 19 IWRC	13.0	11.0	7.7
1- 1/4	7 x 6 x 19 IWRC	16.0	13.0	9.2
1- 5/16	7 x 6 x 19 IWRC	17.0	14.0	10.0
1- 3/8	7 x 6 x 19 IWRC	19.0	15.0	11.0
1- 1/2	7 x 6 x 19 IWRC	22.0	18.0	13.0

TABLE F-9: PART 2—3-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)		
		3-Leg Bridle Sling		
Dia. (Inches)	Constr.	Vert 30 deg	45 degree	Vert 60 deg
		Horz 60 deg	Angle	Horz 30 deg
1/4	7 x 7 x 7	1.3	1.1	0.75
3/8	7 x 7 x 7	2.8	2.3	1.6
1/2	7 x 7 x 7	4.8	3.9	2.8
5/8	7 x 7 x 7	7.2	5.9	4.2
3/4	7 x 7 x 7	9.9	8.1	5.7
5/8	7 x 7 x 19	7.5	6.1	4.3
3/4	7 x 7 x 19	10.0	8.6	6.1

TABLE F-9: PART 2—3-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)		
		3-Leg Bridle Sling		
Dia. (Inches)	Constr.	Vert 30 deg	45 degree	Vert 60 deg
		Horz 60 deg	Angle	Horz 30 deg
7/8	7 x 7 x 19	14.0	11.0	8.1
1	7 x 7 x 19	18.0	14.0	10.0
1- 1/8	7 x 7 x 19	21.0	17.0	12.0
1- 1/4	7 x 7 x 19	26.0	21.0	15.0
3/4	7 x 6 x 19 IWRC	9.9	8.0	5.7
7/8	7 x 6 x 19 IWRC	13.0	11.0	7.5
1	7 x 6 x 19 IWRC	17.0	13.0	9.6
1- 1/8	7 x 6 x 19 IWRC	20.0	16.0	11.0
1- 1/4	7 x 6 x 19 IWRC	24.0	20.0	14.0
1- 5/16	7 x 6 x 19 IWRC	26.0	21.0	15.0
1- 3/8	7 x 6 x 19 IWRC	28.0	23.0	16.0
1- 1/2	7 x 6 x 19 IWRC	33.0	27.0	19.0

[Order 74-26, § 296-155-335 (part), Table F-9 (codified as WAC 296-155-34909), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34910 Table F-10.

TABLE F-10

RATED CAPACITIES FOR 2-LEG AND 3-LEG BRIDLE SLINGS 8-PART AND 6-PART BRAIDED ROPE 6 x 7 AND 6 x 19 CONSTRUCTION IMPROVED PLOW STEEL GRADE ROPE 7 x 7 CONSTRUCTION GALVANIZED AIRCRAFT GRADE ROPE

TABLE F-10: PART 1—2-Leg Bridle Slings

Component		Rated Capacities, Tons (2,000 lb)					
Rope		2-Leg Bridle Slings					
Dia. (Inches)	Constr.	Vert 30 degree		45 degree		Vert 60 degree	
		Horz 60 degree	Angle	Horz 60 degree	Angle	Horz 30 degree	Angle
		8-Part	6-Part	8-Part	6-Part	8-Part	6-Part
3/32	6 x 7	0.74	0.55	0.60	0.45	0.42	0.32
1/8	6 x 7	1.3	0.98	1.1	0.80	0.76	0.57
3/16	6 x 7	2.9	2.2	2.4	1.8	1.7	1.3
3/32	7 x 7	0.89	0.67	0.72	0.55	0.51	0.39
1/8	7 x 7	1.6	1.2	1.3	1.0	0.95	0.71
3/16	7 x 7	3.6	2.7	2.9	2.2	2.1	1.5
3/16	6 x 19	3.0	2.2	2.4	1.8	1.7	1.3
1/4	6 x 19	5.3	4.0	4.3	3.2	3.1	2.3
5/16	6 x 19	8.3	6.2	6.7	5.0	4.8	3.6
3/8	6 x 19	12.0	8.9	9.7	7.2	6.8	5.1
7/16	6 x 19	16.0	12.0	13.0	9.8	9.3	6.9
1/2	6 x 19	21.0	15.0	17.0	13.0	12.0	9.0
9/16	6 x 19	26.0	20.0	21.0	16.0	15.0	11.0
5/8	6 x 19	32.0	24.0	26.0	20.0	19.0	14.0
3/4	6 x 19	46.0	35.0	38.0	28.0	27.0	20.0
7/8	6 x 19	62.0	47.0	51.0	38.0	36.0	27.0
1	6 x 19	81.0	61.0	66.0	50.0	47.0	35.0

TABLE F-10: PART 2—3-Leg Bridle Slings

Component		Rated Capacities, Tons (2,000 lb)					
Rope		3-Leg Bridle Slings					
Dia. (Inches)	Constr.	Vert 30 degree		45 degree		Vert 60 degree	
		Horz 60 degree	Angle	Horz 30 degree	Angle	Horz 30 degree	Angle
		8-Part	6-Part	8-Part	6-Part	8-Part	6-Part
3/32	6 x 7	1.1	0.83	0.90	0.68	0.64	0.48
1/8	6 x 7	2.0	1.5	1.6	1.2	1.1	0.85
3/16	6 x 7	4.4	3.3	3.6	2.7	2.5	1.9
3/32	7 x 7	1.3	1.0	1.1	0.82	0.77	0.58
1/8	7 x 7	2.5	1.8	2.0	1.5	1.4	1.1
3/16	7 x 7	5.4	4.0	4.4	3.3	3.1	2.3
3/16	6 x 19	4.5	3.4	3.7	2.8	2.6	1.9
1/4	6 x 19	8.0	6.0	6.5	4.9	4.6	3.4
5/16	6 x 19	12.0	9.3	10.0	7.6	7.1	5.4
3/8	6 x 19	18.0	13.0	14.0	11.0	10.0	7.7
7/16	6 x 19	24.0	18.0	20.0	15.0	14.0	10.0
1/2	6 x 19	31.0	23.0	25.0	19.0	18.0	13.0
9/16	6 x 19	39.0	29.0	32.0	24.0	23.0	17.0
5/8	6 x 19	48.0	36.0	40.0	30.0	28.0	21.0
3/4	6 x 19	69.0	52.0	56.0	42.0	40.0	30.0
7/8	6 x 19	94.0	70.0	76.0	57.0	54.0	40.0
1	6 x 19	122.0	91.0	99.0	74.0	70.0	53.0

[Order 74-26, § 296-155-335 (part), Table F-10 (codified as WAC 296-155-34910), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34911 Table F-11.

TABLE F-11

RATED CAPACITIES FOR STRAND LAID GROMMET - HAND TUCKED IMPROVED PLOW STEEL GRADE ROPE

Rope Body		Rated Capacities, Tons (2,000 lb)		
Dia. (inches)	Constr.	Vertical	Choker	Vertical Basket*
5/16	7 x 19	1.3	1.0	2.6
3/8	7 x 19	1.9	1.4	3.8
7/16	7 x 19	2.6	1.9	5.2
1/2	7 x 19	3.3	2.5	6.7
9/16	7 x 19	4.2	3.1	8.4
5/8	7 x 19	5.2	3.9	10.00
3/4	7 x 19	7.4	5.6	15.0
7/8	7 x 19	10.0	7.5	20.0
1	7 x 19	13.0	9.7	26.0
1-1/8	7 x 19	16.0	12.0	32.0
1-1/4	7 x 37	18.0	14.0	37.0
1-3/8	7 x 37	22.0	16.0	44.0
1-1/2	7 x 37	26.0	19.0	52.0

* These values only apply when the D/d ratio is 5 or greater where:
D = Diameter of curvature around which rope is bent.
d = Diameter of rope body.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-34911, filed 1/21/86; Order 74-26, § 296-155-335 (part), Table F-11 (codified as WAC 296-155-34911), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34912 Table F-12.

TABLE F-12

RATED CAPACITIES FOR CABLE LAID GROMMET - HAND TUCKED 7 x 6 x 7 AND 7 x 6 x 19 CONSTRUCTIONS IMPROVED PLOW STEEL GRADE ROPE 7 x 7 x 7 CONSTRUCTION GALVANIZED AIRCRAFT GRADE ROPE

Cable Body		Rated Capacities, Tons (2,000 lb)		
Dia. (inches)	Constr.	Vertical	Choker	Vertical Basket*
9/16	7 x 6 x 7	2.8	2.1	5.6
5/8	7 x 6 x 7	3.8	2.8	7.6
3/8	7 x 7 x 7	1.6	1.2	3.2
9/16	7 x 7 x 7	3.5	2.6	6.9
5/8	7 x 7 x 7	4.5	3.4	9.0
5/8	7 x 6 x 19	3.9	3.0	7.9
3/4	7 x 6 x 19	5.1	3.8	10.0
15/16	7 x 6 x 19	7.9	5.9	16.0
1-1/8	7 x 6 x 19	11.0	8.4	22.0
1-5/16	7 x 6 x 19	15.0	11.0	30.0
1-1/2	7 x 6 x 19	19.0	14.0	39.0
1-11/16	7 x 6 x 19	24.0	18.0	49.0
1-7/8	7 x 6 x 19	30.0	22.0	60.0
2-1/4	7 x 6 x 19	42.0	31.0	84.0
2-5/8	7 x 6 x 19	56.0	42.0	112.0

* These values only apply when the D/d ratio is 5 or greater where:

D = Diameter of curvature around which cable body is bent.
d = Diameter of cable body.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-34912, filed 1/21/86; Order 74-26, § 296-155-335 (part), Table F-12 (codified as WAC 296-155-34912), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34913 Table F-13.

TABLE F-13

RATED CAPACITIES FOR STRAND LAID ENDLESS SLINGS-MECHANICAL JOINT IMPROVED PLOW STEEL GRADE ROPE

ROPE BODY		RATED CAPACITIES, TONS (2,000 lb)		
Dia. (inches)	Constr.	Vertical	Choker	Vertical Basket*
3/8	6 x 19 IWRC	2.0	1.5	4.1
1/2	6 x 19 IWRC	3.6	2.7	7.2
5/8	6 x 19 IWRC	5.6	4.2	11.0
3/4	6 x 19 IWRC	8.0	6.0	16.0
7/8	6 x 19 IWRC	11.0	8.1	21.0
1	6 x 19 IWRC	14.0	10.0	28.0
1 - 1/8	6 x 19 IWRC	18.0	13.0	35.0
1 - 1/4	6 x 37 IWRC	21.0	15.0	41.0
1 - 3/8	6 x 37 IWRC	25.0	19.0	50.0
1 - 1/2	6 x 37 IWRC	29.0	22.0	59.0

* These values only apply when the D/d ratio is 5 or greater where:
D = Diameter of curvature around which rope is bent.
d = Diameter of rope body.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-34913, filed 1/21/86; Order 74-26, § 296-155-335 (part), Table F-13 (codified as WAC 296-155-34913), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34914 Table F-14.

TABLE F-14

RATED CAPACITIES FOR CABLE LAID
ENDLESS SLINGS-MECHANICAL JOINT
7 x 7 x 7 AND 7 x 7 x 19 CONSTRUCTIONS
GALVANIZED AIRCRAFT GRADE ROPE
7 x 6 x 19 IWRC CONSTRUCTION IMPROVED
PLOW STEEL GRADE ROPE

CABLE BODY		RATED CAPACITIES, TONS (2,000 lb)			
Dia. (inches)	Constr.	Vertical	Choker	Vertical Basket*	
1/4	7 x 7 x 7	0.83	0.62	1.6	
3/8	7 x 7 x 7	1.8	1.3	3.5	
1/2	7 x 7 x 7	3.0	2.3	6.1	
5/8	7 x 7 x 7	4.5	3.4	9.1	
3/4	7 x 7 x 7	6.3	4.7	12.0	
5/8	7 x 7 x 19	4.7	3.5	9.5	
3/4	7 x 7 x 19	6.7	5.0	13.0	
7/8	7 x 7 x 19	8.9	6.6	18.0	
1	7 x 7 x 19	11.0	8.5	22.0	
1 - 1/8	7 x 7 x 19	14.0	10.0	28.0	
1 - 1/4	7 x 7 x 19	17.0	12.0	33.0	
3/4	7 x 6 x 19	IWRC	6.2	4.7	12.0
7/8	7 x 6 x 19	IWRC	8.3	6.2	16.0
1	7 x 6 x 19	IWRC	10.0	7.9	21.0
1 - 1/8	7 x 6 x 19	IWRC	13.0	9.7	26.0
1 - 1/4	7 x 6 x 19	IWRC	16.0	12.0	31.0
1 - 3/4	7 x 6 x 19	IWRC	18.0	14.0	37.0
1 - 1/2	7 x 6 x 19	IWRC	22.0	16.0	43.0

* These values only apply when the D/d value is 5 or greater where:
D = Diameter of curvature around which cable body is bent.
d = Diameter of cable body.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-34914, filed 1/21/86; Order 74-26, § 296-155-335 (part), Table F-14 (codified as WAC 296-155-34914), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34915 Table F-15.

TABLE F-15

MANILA ROPE SLINGS

TABLE F-15: PART 1—Eye and Eye Slings

RATED CAPACITY IN POUNDS (Safety Factor = 5)									
EYE AND EYE SLING									
BASKET HITCH									
Angle of Rope to Horizontal									
90 deg 60 deg 45 deg 30 deg									
Angle of Rope to Vertical									
ROPE Dia- meter Nomi- nal in Inches	Nomi- weight per 100 ft in Pounds	Mini- mum Break- ing Strength in Pounds	Ver- tical Hitch	Chok- er Hitch	0 deg	30 deg	45 deg	60 deg	90 deg
1/2	7.5	2,650	550	250	1,100	900	750	550	550
9/16	10.4	3,450	700	350	1,400	1,200	1,000	700	700
5/8	13.3	4,400	900	450	1,800	1,500	1,200	900	900

(1999 Ed.)

3/4	16.7	5,400	1,100	550	2,200	1,900	1,500	1,100	1,100
13/16	19.5	6,500	1,300	650	2,600	2,300	1,800	1,300	1,300
7/8	22.5	7,700	1,500	750	3,100	2,700	2,200	1,500	1,500
1	27.0	9,000	1,800	900	3,600	3,100	2,600	1,800	1,800
1 1/16	31.3	10,500	2,100	1,100	4,200	3,600	3,000	2,100	2,100
1 1/8	36.0	12,000	2,400	1,200	4,800	4,200	3,400	2,400	2,400
1 1/4	41.7	13,500	2,700	1,400	5,400	4,700	3,800	2,700	2,700
1 5/16	47.9	15,000	3,000	1,500	6,000	5,200	4,300	3,000	3,000
1 1/2	59.9	18,500	3,700	1,850	7,400	6,400	5,200	3,700	3,700
1 5/8	74.6	22,500	4,500	2,300	9,000	7,800	6,400	4,500	4,500
1 3/4	89.3	26,500	5,300	2,700	10,500	9,200	7,500	5,300	5,300
2	107.5	31,000	6,200	3,100	12,500	10,500	8,800	6,200	6,200
2 1/3	125.0	36,000	7,200	3,600	14,500	12,500	10,000	7,200	7,200
2 1/4	146.0	41,000	8,200	4,100	16,500	14,000	11,500	8,200	8,200
2 1/2	166.7	46,500	9,300	4,700	18,500	16,000	13,000	9,300	9,300
2 5/8	190.8	52,000	10,500	5,200	21,000	18,000	14,500	10,500	10,500

TABLE F-15: PART 2—Endless Slings

RATED CAPACITY IN POUNDS (Safety Factor = 5)									
ENDLESS SLING									
BASKET HITCH									
Angle of Rope to Horizontal									
90 deg 60 deg 45 deg 30 deg									
Angle of Rope to Vertical									
ROPE Dia- meter Nomi- nal in Inches	Nomi- weight per 100 ft in Pounds	Mini- mum Break- ing Strength in Pounds	Ver- tical Hitch	Chok- er Hitch	0 deg	30 deg	45 deg	60 deg	90 deg
1/2	7.5	2,650	950	500	1,900	1,700	1,400	950	950
9/16	10.4	3,450	1,200	600	2,500	2,200	1,800	1,200	1,200
5/8	13.3	4,400	1,600	800	3,200	2,700	2,200	1,600	1,600
3/4	16.7	5,400	2,000	950	3,900	3,400	2,800	2,000	2,000
1 3/16	19.5	6,500	2,300	1,200	4,700	4,100	3,300	2,300	2,300
7/8	22.5	7,700	2,800	1,400	5,600	4,800	3,900	2,800	2,800
1	27.0	9,000	3,200	1,600	6,500	5,600	4,600	3,200	3,200
1 1/16	31.3	10,500	3,800	1,900	7,600	6,600	5,400	3,800	3,800
1 1/8	36.0	12,000	4,300	2,200	8,600	7,500	6,100	4,300	4,300
1 1/4	41.7	13,500	4,900	2,400	9,700	8,400	6,900	4,900	4,900
1 5/16	47.9	15,000	5,400	2,700	11,000	9,400	7,700	5,400	5,400
1 1/2	59.9	18,500	6,700	3,300	13,500	11,500	9,400	6,700	6,700
1 5/8	74.6	22,500	8,100	4,100	16,000	14,000	11,500	8,000	8,000
1 3/4	89.3	26,500	9,500	4,800	19,000	16,500	13,500	9,500	9,500
2	107.5	31,000	11,000	5,600	22,500	19,500	16,000	11,000	11,000
2 1/3	125.0	36,000	13,000	6,500	26,000	22,500	18,500	13,000	13,000
2 1/4	146.0	41,000	15,000	7,400	29,500	25,500	21,000	15,000	15,000
2 1/2	166.7	46,500	16,500	8,400	33,500	29,000	23,500	16,500	16,500
2 5/8	190.8	52,000	18,500	9,500	37,500	32,500	26,500	18,500	18,500

[Title 296 WAC—p. 2185]

[Order 74-26, § 296-155-335 (part), Table F-15 (codified as WAC 296-155-34915), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34916 Table F-16.

TABLE F-16

NYLON ROPE SLINGS

TABLE F-16: PART 1—Eye and Eye Slings

RATED CAPACITY IN POUNDS (Safety Factor = 9)									
EYE AND EYE SLING									
BASKET HITCH									
Angle of Rope to Horizontal									
		90 deg		60 deg		45 deg		30 deg	
ROPE Dia- meter Nomi- nal in Inches	Nominal weight per 100 ft in Pounds	Mini- mum Break- ing Strength in Pounds	Ver- tical Hitch	Chok- er Hitch	Angle of Rope to Vertical				
					0 deg	30 deg	45 deg	60 deg	
1/2	6.5	6,080	700	350	1,400	1,200	950	700	
9/16	8.3	7,600	850	400	1,700	1,500	1,200	850	
5/8	10.5	9,880	1,100	550	2,200	1,900	1,600	1,100	
3/4	14.5	13,490	1,500	750	3,000	2,600	2,100	1,500	
1 3/16	17.0	16,150	1,800	900	3,600	3,100	2,600	1,800	
7/8	20.0	19,000	2,100	1,100	4,200	3,700	3,000	2,100	
1	26.0	23,750	2,600	1,300	5,300	4,600	3,700	2,600	
1 1/16	29.0	27,360	3,000	1,500	6,100	5,300	4,300	3,000	
1 1/8	34.0	31,350	3,500	1,700	7,000	6,000	5,000	3,500	
1 1/4	40.0	35,625	4,000	2,000	7,900	6,900	5,600	4,000	
1 5/16	45.0	40,850	4,500	2,300	9,100	7,900	6,400	4,500	
1 1/2	55.0	50,350	5,600	2,800	11,000	9,700	7,900	5,600	
1 5/8	68.0	61,750	6,900	3,400	13,500	12,000	9,700	6,900	
1 3/4	83.0	74,100	8,200	4,100	16,500	14,500	11,500	8,200	
2	95.0	87,400	9,700	4,900	19,500	17,000	13,500	9,700	
2 1/8	109.0	100,700	11,000	5,600	22,500	19,500	16,000	11,000	
2 1/4	129.0	118,750	13,000	6,600	26,500	23,000	18,500	13,000	
2 1/2	149.0	133,000	15,000	7,400	29,500	25,500	21,000	15,000	
2 5/8	168.0	153,900	17,100	8,600	34,000	29,500	24,000	17,000	

TABLE F-16: PART 2—Endless Slings

RATED CAPACITY IN POUNDS (Safety Factor = 9)									
ENDLESS SLING									
BASKET HITCH									
Angle of Rope to Horizontal									
		90 deg		60 deg		45 deg		30 deg	
ROPE Dia- meter Nomi- nal in Inches	Nominal weight per 100 ft in Pounds	Mini- mum Break- ing Strength in Pounds	Ver- tical Hitch	Chok- er Hitch	Angle of Rope to Vertical				
					0 deg	30 deg	45 deg	60 deg	
1/2	6.5	6,080	1,200	600	2,400	2,100	1,700	1,200	
9/16	8.3	7,600	1,500	750	3,000	2,600	2,200	1,500	
5/8	10.5	9,880	2,000	1,000	4,000	3,400	2,800	2,000	
3/4	14.5	13,490	2,700	1,400	5,400	4,700	3,800	2,700	
1 3/16	17.0	16,150	3,200	1,600	6,400	5,600	4,600	3,200	
7/8	20.0	19,000	3,800	1,900	7,600	6,600	5,400	3,800	
1	26.0	23,750	4,800	2,400	9,500	8,200	6,700	4,800	
1 1/16	29.0	27,360	5,500	2,700	11,000	9,500	7,700	5,500	
1 1/8	34.0	31,350	6,300	3,100	12,500	11,000	8,900	6,300	
1 1/4	40.0	35,625	7,100	3,600	14,500	12,500	10,000	7,100	
1 5/16	45.0	40,850	8,200	4,100	16,500	14,000	12,000	8,200	
1 1/2	55.0	50,350	10,000	5,000	20,000	17,500	14,000	10,000	
1 5/8	68.0	61,750	12,500	6,200	24,500	21,500	17,500	12,500	
1 3/4	83.0	74,100	15,000	7,400	29,500	27,500	21,000	15,000	
2	95.0	87,400	17,500	8,700	35,000	30,500	24,500	17,500	
2 1/8	109.0	100,700	20,000	10,000	40,500	35,000	28,500	20,000	
2 1/4	129.0	118,750	24,000	12,000	47,500	41,000	33,500	24,000	
2 1/2	149.0	133,000	26,500	13,500	53,000	46,000	37,500	26,500	
2 5/8	168.0	153,900	31,000	15,500	61,500	53,500	43,500	31,000	

[Order 74-26, § 296-155-335 (part), Table F-16 (codified as WAC 296-155-34916), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34917 Table F-17.

TABLE F-17

POLYESTER ROPE SLINGS

TABLE F-17: PART 1—Eye and Eye Slings

RATED CAPACITY IN POUNDS (Safety Factor = 9)									
EYE AND EYE SLING									
BASKET HITCH									
Angle of Rope to Horizontal									
		90 deg		60 deg		45 deg		30 deg	
ROPE Dia- meter Nomi- nal in Inches	Nominal weight per 100 ft in Pounds	Mini- mum Break- ing Strength in Pounds	Ver- tical Hitch	Chok- er Hitch	Angle of Rope to Vertical				
					0 deg	30 deg	45 deg	60 deg	
1/2	8.0	6,080	700	350	1,400	1,200	950	700	
9/16	10.2	7,600	850	400	1,700	1,500	1,200	850	

	5/8	13.0	9,500	1,100	550	2,100	1,800	1,500	1,100
	3/4	17.5	11,875	1,300	650	2,600	2,300	1,900	1,300
1	3/16	21.0	14,725	1,600	800	3,300	2,800	2,300	1,600
	7/8	25.0	17,100	1,900	950	3,800	3,300	2,700	1,900
1		30.5	20,900	2,300	1,200	4,600	4,000	3,300	2,300
1	1/16	34.5	24,225	2,700	1,300	5,400	4,700	3,800	2,700
1	1/8	40.0	28,025	3,100	1,600	6,200	5,400	4,400	3,100
1	1/4	46.3	31,540	3,500	1,800	7,000	6,100	5,000	3,500
1	5/16	52.5	35,625	4,000	2,000	7,900	6,900	5,600	4,000
1	1/2	66.8	44,460	4,900	2,500	9,900	8,600	7,000	4,900
1	5/8	82.0	54,150	6,000	3,000	12,000	10,400	8,500	6,000
1	3/4	98.0	64,410	7,200	3,600	14,500	12,500	10,000	7,200
2		118.0	76,000	8,400	4,200	17,000	14,500	12,000	8,400
2	1/8	135.0	87,400	9,700	4,900	19,500	17,000	13,500	9,700
2	1/4	157.0	101,650	11,500	5,700	22,500	19,500	16,000	11,500
2	1/2	181.0	115,900	13,000	6,400	26,000	22,500	18,000	13,000
2	5/8	205.0	130,150	14,500	7,200	29,000	25,000	20,500	14,500

TABLE F-17: PART 2—Endless Sling

RATED CAPACITY IN POUNDS (Safety Factor = 9)									
ENDLESS SLING									
BASKET HITCH									
Angle of Rope to Horizontal									
90 60 45 30 deg deg deg deg									
Angle of Rope to Vertical									
ROPE Dia- meter	Nominal weight	Mini- mum Break- ing	Ver- tical Hitch	Chok- er Hitch	0 deg	30 deg	45 deg	60 deg	
Nomi- nal in Inches	per 100 ft in Pounds	Strength in Pounds							
	1/2	8.0	6,080	1,200	600	2,400	2,100	1,700	1,200
	9/16	10.2	7,600	1,500	750	3,000	2,600	2,200	1,500
	5/8	13.0	9,500	1,900	950	3,800	3,300	2,700	1,900
	3/4	17.5	11,875	2,400	1,200	4,800	4,100	3,400	2,400
1	3/16	21.0	14,725	2,900	1,500	5,900	5,100	4,200	2,900
	7/8	25.0	17,100	3,400	1,700	6,800	5,900	4,800	3,400
1		30.5	20,900	4,200	2,100	8,400	7,200	5,900	4,200
1	1/16	34.5	24,225	4,800	2,400	9,700	8,400	6,900	4,800
1	1/8	40.0	28,025	5,600	2,800	11,000	9,700	7,900	5,600
1	1/4	46.3	31,540	6,300	3,200	12,500	11,000	8,900	6,300
1	5/16	52.5	35,625	7,100	3,600	14,500	12,500	10,000	7,100
1	1/2	66.8	44,460	8,900	4,400	18,000	15,500	12,500	8,900
1	5/8	82.0	54,150	11,000	5,400	21,500	19,000	15,500	11,000
1	3/4	98.0	64,410	13,000	6,400	26,000	22,500	18,000	13,000
2		118.0	76,000	15,000	7,600	30,500	26,500	21,500	15,000
2	1/8	135.0	87,400	17,500	8,700	35,000	30,500	24,500	17,500
2	1/4	157.0	101,650	20,500	10,000	40,500	35,000	29,000	20,500
2	1/2	181.0	115,900	23,000	11,500	46,500	40,000	33,000	23,000
2	5/8	205.0	130,150	26,000	13,000	52,000	45,000	37,000	26,000

[Order 74-26, § 296-155-335 (part), Table F-17 (codified as WAC 296-155-34917), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34918 Table F-18.

TABLE F-18

POLYPROPYLENE ROPE SLINGS

TABLE F-18: PART 1—Eye and Eye Sling

RATED CAPACITY IN POUNDS (Safety Factor = 6)									
EYE AND EYE SLING									
BASKET HITCH									
Angle of Rope to Horizontal									
90 60 45 30 deg deg deg deg									
Angle of Rope to Vertical									
ROPE Dia- meter	Nom- inal weight	Mini- mum Break- ing	Ver- tical Hitch	Choker Hitch	0 deg	30 deg	45 deg	60 deg	
Nomi- nal in Inches	100 ft in Pounds	Strength in Pounds							
	1/2	4.7	3,990	650	350	1,300	1,200	950	65
	9/16	6.1	4,845	800	400	1,600	1,400	1,100	800
	5/8	7.5	5,890	1,000	500	2,000	1,700	1,400	1,000
	3/4	10.7	8,075	1,300	700	2,700	2,300	1,900	1,300
	13/16	12.7	9,405	1,600	800	3,100	2,700	2,200	1,600
	7/8	15.0	10,925	1,800	900	3,600	3,200	2,600	1,800
1		18.0	13,300	2,200	1,100	4,400	3,800	3,100	2,200
1	1/16	20.4	15,200	2,500	1,300	5,100	4,400	3,600	2,500
1	1/8	23.7	17,385	2,900	1,500	5,800	5,000	4,100	2,900
1	1/4	27.0	19,950	3,300	1,700	6,700	5,800	4,700	3,300
1	5/16	30.5	22,325	3,700	1,900	7,400	6,400	5,300	3,700
1	1/2	38.5	28,215	4,700	2,400	9,400	8,100	6,700	4,700
1	5/8	47.5	34,200	5,700	2,900	11,500	9,900	8,100	5,700
1	3/4	57.0	40,850	6,800	3,400	13,500	12,000	9,600	6,800
2		69.0	49,400	8,200	4,100	16,500	14,500	11,500	8,200
2	1/8	80.0	57,950	9,700	4,800	19,500	16,500	13,500	9,700
2	1/4	92.0	65,550	11,000	5,500	22,000	19,000	15,500	11,000
2	1/2	107.0	76,000	12,500	6,300	25,500	22,000	18,000	12,500
2	5/8	120.0	85,500	14,500	7,100	28,500	24,500	20,000	14,500

TABLE F-18: PART 2—Endless Sling

RATED CAPACITY IN POUNDS (Safety Factor = 6)										
ENDLESS SLING										
BASKET HITCH										
ROPE Dia- meter		Nom- inal weight	Mini- mum Break- ing Strength	Ver- tical Hitch	Choker Hitch	Angle of Rope to Horizontal				Angle of Rope to Vertical
						90 deg	60 deg	45 deg	30 deg	
Nomi- nal in Inches	per 100 ft in Pounds	in Pounds	in Pounds	in Pounds	in Pounds	0 deg	30 deg	45 deg	60 deg	
1/2	4.7	3,990	1,200	600	2,400	2,100	1,700	1,200		
9/16	6.1	4,845	1,500	750	2,900	2,500	2,100	1,500		
5/8	7.5	5,890	1,800	900	3,500	3,100	2,500	1,800		
3/4	10.7	8,075	2,400	1,200	4,900	4,200	3,400	2,400		
1 3/16	12.7	9,405	2,800	1,400	5,600	4,900	4,000	2,800		
7/8	15.0	10,925	3,300	1,600	6,600	5,700	4,600	3,300		
1	18.0	13,300	4,000	2,000	8,000	6,900	5,600	4,000		
1 1/16	20.4	15,200	4,600	2,300	9,100	7,900	6,500	4,600		
1 1/8	23.7	17,385	5,200	2,600	10,500	9,000	7,400	5,200		
1 1/4	27.0	19,950	6,000	3,000	12,000	10,500	8,500	6,000		
1 5/16	30.5	22,325	6,700	3,400	13,500	11,500	9,500	6,700		
1 1/2	38.5	28,215	8,500	4,200	17,000	14,500	12,000	8,500		
1 5/8	47.5	34,200	10,500	5,100	20,500	18,000	14,500	10,500		
1 3/4	57.0	40,850	12,500	6,100	24,500	21,000	17,500	12,500		
2	69.0	49,400	15,000	7,400	29,500	25,500	21,000	15,000		
2 1/8	80.0	57,950	17,500	8,700	35,000	30,100	24,500	17,500		
2 1/4	92.0	65,550	19,500	9,900	39,500	34,000	28,000	19,500		
2 1/2	107.0	76,000	23,000	11,500	45,500	39,500	32,500	23,000		
2 5/8	120.0	85,500	25,500	13,000	51,500	44,500	36,500	25,500		

[Order 74-26, § 296-155-335 (part), Table F-18 (codified as WAC 296-155-34918), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34919 Table F-19.

TABLE F-19

SAFE WORKING LOADS FOR SHACKLES
(In tons of 2,000 pounds)

Material size (inches)	Pin diameter (inches)	Safe working load
1/2	5/8	1.4
5/8	3/4	2.2
3/4	7/8	3.2
7/8	1	4.3
1	1 1/8	5.6
1 1/8	1 1/4	6.7
1 1/4	1 3/8	8.2
1 3/8	1 1/2	10.0
1 1/2	1 5/8	11.9
1 3/4	2	16.2
2	2 1/4	21.2

[Order 74-26, § 296-155-335 (part), Table F-19 (codified as WAC 296-155-34919), filed 5/7/74, effective 6/6/74.]

WAC 296-155-34920 Table F-20.

TABLE F-20

NUMBER AND SPACING OF U-BOLT
WIRE ROPE CLIPS

Improved plow steel	Number of Clips	Minimum spacing (inches)
	Drop forged	
3/8 and under	2	3
1/2	3	3
5/8	3	3
3/4	4	4 1/2
7/8	4	5 1/4
1	5	6
1 1/8	6	7
1 1/4	6	8
1 3/8	7	9
1 1/2	7	10

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-34920, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-34920, filed 1/21/86; Order 74-26, § 296-155-335 (part), Table F-20 (codified as WAC 296-155-34920), filed 5/7/74, effective 6/6/74.]

PART G

TOOLS—HAND AND POWER

WAC 296-155-350 General requirements. (1) Condition of tools. All hand and power tools and similar equipment, whether furnished by the employer or the employee, shall be maintained in a safe condition.

(2) Guarding.

(a) When power operated tools are designed to accommodate guards, they shall be equipped with such guards when in use.

(b) Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating or moving parts of equipment shall be guarded if such parts are exposed to contact by employees or otherwise create a hazard. Guarding shall meet the requirements as set forth in American National Standards Institute, B15.1-1953 (R1958), Safety Code for Mechanical Power-Transmission Apparatus.

(3) Personal protective equipment. Employees using hand and power tools and exposed to the hazard of falling, flying, abrasive, and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases shall use the particular personal protective equipment necessary to protect them from the hazard. All personal protective equipment shall meet the requirements and be maintained according to Parts B and C of this chapter.

(4) Switches.

(a) Scope. This subsection does not apply to concrete vibrators, concrete breakers, powered tampers, jack hammers, rock drills, and similar hand operated power tools.

(b) All hand-held powered platen sanders, grinders with wheels 2-inch diameter or less, routers, planers, laminate trimmers, nibblers, shears, scroll saws, and jigsaws with blade shanks one-fourth of an inch wide or less may be equipped with only a positive "on-off" control.

(c) All hand-held powered drills, tappers, fastener drivers, horizontal, vertical, and angle grinders with wheels

greater than 2 inches in diameter, disc sanders, belt sanders, reciprocating saws, saber saws, and other similar operating powered tools shall be equipped with a momentary contact "on-off" control and may have a lock-on control provided that turn-off can be accomplished by a single motion of the same finger or fingers that turn it on.

(d) All other hand-held powered tools, such as circular saws, chain saws, and percussion tools, shall be equipped with a constant pressure switch that will shut off the power when the pressure is released.

(e) Disconnect switches. All fixed power driven tools shall be provided with a disconnect switch that can either be locked or tagged in the off position.

(f) Self-feed. Automatic feeding devices shall be installed on machines whenever the nature of the work will permit. Feeder attachments shall have the feed rolls or other moving parts covered or guarded so as to protect the operator from hazardous points.

[Order 74-26, § 296-155-350, filed 5/7/74, effective 6/6/74.]

WAC 296-155-355 Hand tools. (1) Employers shall not issue or permit the use of unsafe hand tools.

(2) Wrenches, including adjustable, pipe, end, and socket wrenches shall not be used when jaws are sprung or worn to the point that slippage occurs.

(3) Nails shall not be cut with an axe.

(4) Impact tools, such as drift pins, wedges, and chisels, shall be kept free of mushroomed heads.

(5) The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the tool.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-355, filed 1/21/86; Order 74-26, § 296-155-355, filed 5/7/74, effective 6/6/74.]

WAC 296-155-360 Power-operated hand tools. (1) Electric power-operated tools.

(a) Electric power operated tools shall either be of the approved double-insulated type or grounded in accordance with Part I of this chapter.

(b) The use of electric cords for hoisting or lowering tools shall not be permitted.

(2) Pneumatic power tools.

(a) Pneumatic power tools and hose sections shall be secured by threaded couplings, quick disconnect couplings or by 100 pound tensile strength safety chain or equivalent across each connection to prevent the tool or hose connections from becoming accidentally disconnected.

(b) Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

(c) All pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed, shall have a safety device on the muzzle to prevent the tool from ejecting fasteners, unless the muzzle is in contact with the work surface.

EXCEPTION: Pneumatic nailers or staplers utilizing "fine wire" brads or staples do not require a muzzle contact safety device, provided:

(1) The overall weight of the fastening device does not exceed the weight of standard 18 gauge wire, 1-1/2 inches long.

(2) The operator and any other person within 12 feet of the point of operation wear approved eye protection.

Note: The normal maximum diameter tolerance for manufacturing standard 18 gauge wire is .045 inches.

(d) Compressed air shall not be used at the nozzle for cleaning purposes except where reduced to less than 30 p.s.i. and then only with effective chip guarding and personal protective equipment which meets the requirements of Part C of this chapter.

Note: The above requirement does not apply to concrete form, mill scale and similar cleaning purposes. Concrete form, mill scale, and similar cleaning may be performed with air pressure exceeding 30 p.s.i. provided the nozzle and/or cleaning pipe is at least three feet long with a quick-closing (deadman) valve between the hose and the nozzle or pipe. The operator and all other employees within range of flying debris shall be protected by eye or face protection as specified in WAC 296-155-215.

(e) The manufacturer's safe operating pressure for hoses, pipes, valves, filters, and other fittings shall not be exceeded.

(f) The use of hoses for hoisting or lowering tools shall not be permitted.

(g) All hoses exceeding 1/2-inch inside diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure.

(h) Airless spray guns of the type which atomize paints and fluids at high pressures (1,000 pounds or more per square inch) shall be equipped with automatic or visible manual safety devices which will prevent pulling of the trigger to prevent release of the paint or fluid until the safety device is manually released.

(i) In lieu of the above, a diffuser nut which will prevent high pressure, high velocity release, while the nozzle tip is removed, plus a nozzle tip guard which will prevent the tip from coming into contact with the operator, or other equivalent protection, shall be provided.

(j) Abrasive blast cleaning nozzles. The blast cleaning nozzles shall be equipped with an operating valve which must be held open manually. A support shall be provided on which the nozzle may be mounted when it is not in use.

(3) Fuel powered tools.

(a) All fuel powered tools shall be stopped while being refueled, serviced, or maintained, and fuel shall be transported, handled, and stored in accordance with Part D of this chapter.

(b) When fuel powered tools are used in enclosed spaces, the applicable requirements for concentrations of toxic gases and use of personal protective equipment as outlined in Parts B and C of this chapter shall apply.

(4) Hydraulic power tools.

(a) The fluid used in hydraulic powered tools shall be fire resistant fluid approved under schedule 30 of the Bureau of Mines, U.S. Department of the Interior, and shall retain its operating characteristics at the most extreme temperatures to which it will be exposed.

(b) The manufacturer's safe operating pressures for hoses, valves, pipes, filters, and other fittings shall not be exceeded.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-360, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-360, filed 1/21/86; Order 76-29, § 296-155-360, filed 9/30/76; Order 76-6, § 296-155-360, filed 3/1/76; Order 74-26, § 296-155-360, filed 5/7/74, effective 6/6/74.]

WAC 296-155-363 Safety requirements for powder actuated fastening systems, in accordance with ANSI A10.3-1985, Safety Requirements for Powder Actuated Fastening Systems.

[Statutory Authority: Chapter 49.17 RCW. 91-11-070 (Order 91-01), § 296-155-363, filed 5/20/91, effective 6/20/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-363, filed 1/21/86.]

WAC 296-155-36301 Scope. This standard provides safety requirements for a powder actuated fastening tool or machine which propels a stud, pin, fastener, or other object for the purpose of affixing it by penetration to another object.

This standard does not apply to devices designed for attaching objects to soft construction materials, such as wood, plaster, tar, dry wallboard, and the like, or to stud welding equipment.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36301, filed 1/21/86.]

WAC 296-155-36303 Purpose. The purpose of this standard is to provide reasonable safety for life, limb, and property, by establishing requirements for design, construction, operation, service, and storage of powder actuated fastening tools, fasteners and power loads.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36303, filed 1/21/86.]

WAC 296-155-36305 Definitions applicable to this section. (1) Angle control - a safety feature designed to prevent a tool from operating when tilted beyond a predetermined angle.

(2) Approved - meeting the requirements of this standard and acceptable to the department of labor and industries.

(3) Cased power load - a power load with the propellant contained in a closed case.

(4) Caseless power load - a power load with the propellant in solid form not requiring containment.

(5) Chamber (noun) - the location in the tool into which the power load is placed and in which it is actuated.

(6) Chamber (verb) - to fit the chamber according to manufacturer's specifications.

(7) Fasteners - any pins (unthreaded heads) or studs (threaded heads) driven by powder actuated tools.

(8) Fixture - a special shield that provides equivalent protection where the standard shield cannot be used.

(9) Head - that portion of a fastener that extends above the work surface after being properly driven.

(10) Misfire - a condition in which the power load fails to ignite after the tool has been operated.

(11) Powder actuated fastening system - a method comprising the use of a powder actuated tool, a power load, and a fastener.

(12) Powder actuated tool (also known as tool) - a tool that utilizes the expanding gases from a power load to drive a fastener.

(13) Power load - the energy source used in powder actuated tools.

(14) Qualified operator - a person who meets the requirements of WAC 296-155-36321 (1) and (2).

(15) Shield - a device, attached to the muzzle end of a tool, which is designed to confine flying particles.

(16) Spalled area - a damaged and nonuniform concrete or masonry surface.

(17) Test velocity - the measurement of fastener velocity performed in accordance with WAC 296-155-36307 (1)(m).

(18) Tools - tools can be divided into two types: Direct acting and indirect acting; and three classes: Low velocity, medium velocity, and high velocity.

(a) Direct acting tool - a tool in which the expanding gas of the power load acts directly on the fastener to be driven.

(b) Indirect acting tool - a tool in which the expanding gas of the power load acts on a captive piston, which in turn drives the fastener.

(c) Low-velocity tool - a tool whose test velocity has been measured ten times while utilizing the highest velocity combination of:

(i) The lightest commercially available fastener designed for that specific tool;

(ii) The strongest commercially available power load that will properly chamber in the tool;

(iii) The piston designed for that tool and appropriate for that fastener; that will produce an average test velocity from the ten tests not in excess of 100 meters per second (328 feet per second) with no single test having a velocity of over 108 m/s (354 ft/s).

(d) Medium-velocity tool - a tool whose test velocity has been measured ten times while utilizing the highest velocity combination of:

(i) The lightest commercially available fastener designed for the tool;

(ii) The strongest commercially available power load that will properly chamber in the tool;

(iii) The piston designed for that tool and appropriate for that fastener; that will produce an average test velocity from ten tests in excess of 100 m/s (328 ft/s) but not in excess of 150 m/s (492 ft/s) with no single test having a velocity of 160 m/s (525 ft/s).

(e) High-velocity tool - a tool whose test velocity has been measured ten times while utilizing the combination of:

(i) The lightest commercially available fastener designed for the tool;

(ii) The strongest commercially available power load which will properly chamber in the tool; that will produce an average velocity from the ten tests in excess of 150 m/s (492 ft/s).

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-36305, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36305, filed 1/21/86.]

WAC 296-155-36307 Requirements. (1) General.

(a) The tool shall be designed to prevent inadvertent actuation.

(b) The tool shall be designed to prevent actuation when dropped in any attitude from a height of 3 meters (10 ft) onto a smooth, hard surface such as concrete or steel, if such actuation can propel a fastener or any part thereof in free flight.

(c) Actuation of the tool shall be dependent upon at least two separate and distinct operations by the operator, with at least one operation being separate from the operation of holding the tool against the work surface.

(d) The tool shall be designed not to be operable other than against a work surface with a force on the work surface equal to 22 newtons (5 lb) greater than the weight of the tool or a minimum impact energy of 4 joules (3 ft-lb).

(e) All tools shall be designed so that compatible protective shields or fixtures, designed, built, and supplied by the manufacturer of the tool, can be used (see WAC 296-155-36307 (2)(b), (3)(b), (4)(b) and 296-155-36313(8)).

(f) The tool shall be designed so that a determinable means of varying the power levels is available for selecting a power level adequate to perform the desired work (see WAC 296-155-36309(5)).

(g) The tool shall be designed so that all principal functional parts can be checked for foreign matter that may affect operation.

(h) The tool shall be designed so that all parts will be of adequate strength to resist maximum stresses imposed upon actuation when the tool is used in accordance with the manufacturer's instructions and is powered by any commercially available power load which will properly chamber in the tool.

(i) Each tool shall bear a legible permanent model designation, which shall serve as a means of identification. Each tool shall also bear a legible, permanent manufacturer's unique serial number.

(j) A lockable container shall be provided for each tool. The words "POWDER ACTUATED TOOL" shall appear in plain sight on the outside of the container. The following notice shall be attached on the inside cover of the container:

"WARNING - POWDER ACTUATED TOOL. TO BE USED ONLY BY A QUALIFIED OPERATOR AND KEPT UNDER LOCK AND KEY WHEN NOT IN USE."

(k) Each tool shall bear a durable warning label with the following statement, or the equivalent:

"WARNING - FOR USE ONLY BY QUALIFIED OPERATORS ACCORDING TO MANUFACTURER'S INSTRUCTION MANUAL."

(l) Each tool shall be supplied with the following:

- (i) Operator's instruction and service manual.
- (ii) Power load chart.
- (iii) Tool inspection record.
- (iv) Service tools and accessories.

(m) In determining tool test velocities, the velocity of the fastener shall be measured in free flight at a distance of 2 meters (6-1/2 ft) from the muzzle end of the tool, using accepted ballistic test methods.

(2) Design requirements - low-velocity class.

(a) Low-velocity tools, indirect-acting (piston) type, as defined in WAC 296-155-36305, shall meet the requirements of WAC 296-155-36307(1).

(b) A shield shall be supplied with each tool.

(3) Design requirements - medium-velocity class.

(a) Medium-velocity tools, indirect-acting (piston) type, as defined in WAC 296-155-36305, shall meet the requirements of WAC 296-155-36307(1).

(b) The tool shall have a shield at least 63 mm (2-1/2 in) in diameter mounted perpendicular to, and concentric with, the muzzle end, when it is indexed to the center position. A special shield or fixture may be used when it provides equivalent protection.

(c) The tool shall be designed so that it cannot be actuated unless it is equipped with a shield or fixture.

(d) The tool shall be designed with angle control so that it will not actuate when equipped with the standard shield indexed to the center position if the bearing surface of the shield is tilted more than 12 degrees from a flat surface.

(4) Design requirements - high-velocity class.

(a) High-velocity tools, direct-acting or indirect-acting type, as defined in WAC 296-155-36305, shall meet the requirements of WAC 296-155-36307(1).

(b) The tool shall have a shield at least 88 mm (3-1/2 in) in diameter mounted perpendicular to, and concentric with, the muzzle end, when it is indexed to the center position. A special shield or fixture may be used when it provides equivalent protection.

(c) The tool shall be designed so that it cannot be actuated unless it is equipped with a shield or fixture.

(d) The tool shall be designed with angle control so that it will not actuate when equipped with the standard shield indexed to the center position, if the bearing surface of the shield is tilted more than eight degrees from a flat surface.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36307, filed 1/21/86.]

WAC 296-155-36309 Power loads. (1) Identification of cased power loads. Cased power loads shall be coded to identify power load levels by case color and power load color as specified in Table G-1.

(2) Identification of caseless power loads. Caseless power loads shall be coded to identify power load levels by power load color as specified in Table G-1 and by configuration.

(3) Power load use limitation. No power load (cased or caseless) shall be used if it will properly chamber in any existing commercially available tool and will cause a fastener to have a test velocity in excess of the maximum test velocities specified for the said tool.

(4) Identification of power load packages. Power load packages shall provide a visual number-color indication of the power level of the power load as specified in Table G-1.

TABLE G-1

Power Load Identification

Power Level	Color Identification		Nominal velocity	
	Case Color	Load Color	Meters per Second (± 13.5)	Feet per Second (± 45)
1	Brass	Gray	91	300
2	Brass	Brown	119	390
3	Brass	Green	146	480
4	Brass	Yellow	174	570
5	Brass	Red	201	660

TABLE G-1

Power Load Identification

6	Brass	Purple	229	750
7	Nickel	Gray	256	840
8	Nickel	Brown	283	930
9	Nickel	Green	311	1020
10	Nickel	Yellow	338	1110
11	Nickel	Red	366	1200
12	Nickel	Purple	393	1290

Note: The nominal velocity applies to a 9.53 mm (3/8-in) diameter 22.7-gram (350-grain) ballistic slug fired in a test device and has no reference to actual fastener velocity developed in any specific tool.

(5) Optional power load variation. Where means other than power loads of varying power levels are to be used to control penetration, such means shall provide an equivalent power level variation.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36309, filed 1/21/86.]

WAC 296-155-36311 Fasteners. Fasteners for use in powder actuated tools shall be designed and manufactured to function compatibly with these tools and, when used in masonry, concrete, or steel, to effect properly the application for which they are recommended.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36311, filed 1/21/86.]

WAC 296-155-36313 Operation. (1) Acceptable tools. Only tools meeting the requirements of this standard shall be used.

(2) Qualified operators. Only qualified operators shall operate tools.

(3) Use lowest velocity. The lowest velocity class of tool that will properly set the fastener shall be used.

(4) Operating limitations. Tools shall be operated in strict accordance with the manufacture's instructions.

(5) Personal protection. Eye or face protection, or both, shall be worn by operators, assistants, and adjacent personnel when tool is in use. Hearing protection shall be used when making fastenings in confined areas.

(6) Daily inspections. Each day, prior to use, the operator shall inspect the tool to determine that it is in proper working condition in accordance with the testing methods recommended by the manufacture of the tool.

(7) Defective tools. Any tool found not to be in proper working condition shall be immediately removed from service and tagged "DEFECTIVE"; it shall not be used until it has been properly repaired in accordance with the manufacture's instructions.

(8) Proper accessories. The proper shield, fixture, adapter, or accessory, suited for the application, as recommended and supplied by the manufacture, shall be used.

(9) Proper loads and fasteners. Only those types of fasteners and power loads recommended by the tool manufacture for a particular tool, or those providing the same level of safety and performance, shall be used.

(10) Questionable material. Before fastening into any questionable material, the operator shall determine its suitability by using a fastener as a center punch. If the fastener point does not easily penetrate, is not blunted, and does not

fracture the material, initial test fastenings shall then be made in accordance with the tool manufacture's recommendations. (See WAC 296-155-36315(3).)

(11) Tool safety. No tool shall be loaded unless it is being prepared for immediate use. If the work is interrupted after loading, the tool shall be unloaded at once.

(12) Powder actuated magazine or clip-fed tools are not considered loaded unless a power load is actually in the ram (firing chamber), even though the magazine or clip is inserted in the tool. If work is interrupted, the firing chamber shall be cleared and the magazine or clip removed.

(13) Pointing tools. Tools shall not be loaded until just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at any person; hands shall be kept clear of the open barrel end.

(14) Tool perpendicular to work. The tool shall always be held perpendicular to the work surface when fastening into any material, except for specific applications recommended by the tool manufacture.

(15) Misfires. In the event of a misfire, the operator shall hold the tool firmly against the work surface for a period of thirty seconds and then follow the explicit instructions set forth in the manufacture's instructions.

(16) Different power levels. Power loads of different power levels and types shall be kept in separate compartments or containers.

(17) Signs. A sign, at least 20 x 25 cm (8 x 10 in), using boldface type no less than 2.5 cm (1 in) in height, shall be posted in plain sight on all construction projects where tools are used. The sign shall bear wording similar to the following: "POWDER ACTUATED TOOL IN USE."

[Statutory Authority: Chapter 49.17 RCW. 91-11-070 (Order 91-01), § 296-155-36313, filed 5/20/91, effective 6/20/91; 89-11-035 (Order 89-03), § 296-155-36313, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36313, filed 1/21/86.]

WAC 296-155-36315 Limitations of use. (1) Explosive and flammable atmospheres. The tool shall not be used in an explosive or flammable atmosphere.

(2) Unattended tools prohibited. A tool shall never be left unattended in a place where it would be available to unauthorized persons.

(3) Fasteners in hard, brittle areas. Fasteners shall not be driven into very hard or brittle materials including, but not limited to, cast iron, glazed tile, hardened steel, glass block, natural rock, hollow tile, or most brick. (See WAC 296-155-36313(10).)

(4) Fasteners in soft materials. Fasteners shall not be driven into easily penetrated or thin materials, or materials of questionable resistance, unless backed by a material that will prevent the fastener from passing completely through the other side.

(5) Fasteners in steel. Fasteners shall not be driven closer than 13 mm (1/2 in) from the edge of steel except for specific applications recommended by the tool manufacturer.

(6) Fasteners in masonry. Fasteners shall not be driven closer than 7.5 cm (3 in) from the unsupported edge of masonry materials except for specific applications recommended by the tool manufacturer.

(7) Fasteners in concrete. Fasteners shall not be driven into concrete unless material thickness is at least three times the fastener shank penetration.

(8) Fasteners in spalls. Fasteners shall not be driven into any spalled area.

(9) Fasteners in existing holes. Fasteners shall not be driven through existing holes unless a specific guide means, as recommended and supplied by the tool manufacturer, is used to ensure positive alignment.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36315, filed 1/21/86.]

WAC 296-155-36317 Maintenance and storage. (1)

Use of tools. The tool shall be serviced and inspected for worn or damaged parts at regular intervals as recommended by the tool manufacturer. Prior to the tool being put back into use, all worn or damaged parts shall be replaced by a qualified person using only parts supplied by the tool manufacturer. A record of this inspection shall be noted and dated on the tool inspection record.

(2) Instruction manuals. Instruction manuals, maintenance tools, and accessories supplied with the tool shall be stored in the tool container when not in use.

(3) Security. Powder actuated tools and power loads shall be locked in a container and stored in a safe place when not in use and shall be accessible only to authorized personnel.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36317, filed 1/21/86.]

WAC 296-155-36319 Authorized instructor. (1)

Operator qualifications. Only persons trained and authorized by the tool manufacturer or by an authorized representative of the tool manufacturer shall be qualified to instruct and qualify operators for the manufacturer's powder actuated tools.

(2) Instructor qualifications. All authorized instructors shall have read and be familiar with this standard, and shall be capable of:

- (a) Disassembling, servicing, and reassembling the tool.
- (b) Recognizing any worn or damaged parts or defective operation.
- (c) Recognizing and clearly identifying the colors used to identify power load levels.
- (d) Using the tool correctly within the limitations of its use.
- (e) Training and testing operators prior to issuing a qualified operator's card.

(3) Instructor's card. All authorized instructors shall have in their possession a valid authorized instructor's card issued and signed by an authorized representative of the manufacturer. The card shall be wallet size of approximately 6 x 9 cm (2-1/2 x 3-1/2 in), and the face of the card shall bear text similar to that shown in Figure G-1.

(4) List of instructors. A list of all instructors authorized by the manufacturer to instruct and qualify operators shall be maintained by the tool manufacturer and be made available to the department of labor and industries.

(5) Revocation of instructor card. Instructor's card may be revoked by the authorizing agent or the department of labor and industries, if the instructor is known to have issued

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a qualified operator's card in violation of any regulation contained in this standard. When an instructor is no longer authorized to issue qualified operator's cards, cards shall be surrendered to the authorizing agent or the department of labor and industries.

AUTHORIZED INSTRUCTOR

..... Powder Actuated Tools Date

(MAKE)

Card No. Social Security No.

This certifies that

(NAME OF INSTRUCTOR)

has received the prescribed training in the operation and maintenance of powder actuated tools manufactured by

..... and is qualified

(NAME OF MANUFACTURER)

to train and certify operators of

(MAKE)

powder actuated tools.

Model(s)

Authorized by

I have received instruction by the manufacturer's authorized representative in the training of operators of the above tools and agree to conform to all rules and regulations governing the instruction of tool operators.

Date of Birth

(SIGNATURE)

Figure G-1

Sample of Authorized Instructor's Card

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-36319, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36319, filed 1/21/86.]

WAC 296-155-36321 Qualified operator. (1) Operator qualifications. The operator shall be trained by an authorized instructor to be familiar with the provisions of this standard and the instructions provided by the manufacturer for operation and maintenance. The operator shall also be capable of:

- (a) Reading and understanding the manufacturer's instruction manual.
- (b) Cleaning the tool correctly.
- (c) Recognizing any worn or damaged parts or defective operation.
- (d) Recognizing the number-color code system used in this standard to identify power load levels. In the event the operator is unable to distinguish the colors used, the operator shall be given special instruction which will enable the operator to avoid error.
- (e) Using a tool correctly within the limitations of its use and demonstrate competence by operating the tool in the presence of the instructor.

(2) Operator examination. After training, the operator shall substantiate competency by completing satisfactorily a written examination provided by the manufacturer of the tool.

(a) The operator's written examination shall consist of questions to establish the operator's competence with respect to:

- (i) The requirements of this standard;
- (ii) The powder actuated fastening system; and
- (iii) The specific details of operation and maintenance of the tool(s) involved.

(b) The examination shall provide a statement, attested to by the instructor, that the applicant can (or cannot) readily

distinguish the colors used to identify power load levels (see WAC 296-155-36309).

(3) Operator's card. Each applicant who meets the requirements as set forth in subsections (1) and (2) of this section shall receive a qualified operator's card, issued and signed by both the instructor and applicant. While using the tool, the operator shall carry this card.

(4) Card features. The qualified operator's card supplied by the manufacturer shall be wallet size of approximately 6 x 9 cm (2-1/2 x 3-1/2 in), and the face of the card shall bear text similar to that shown in Figure G-2.

(5) Revocation notation. There shall be printed on the card a notation reading:

"Revocation of card - Failure to comply with any of the rules and regulations for safe operation of powder actuated fastening tools shall be cause for the immediate revocation of this card."

QUALIFIED OPERATOR

..... Powder Actuated Tools Date

(MAKE)

Card No. Social Security No.

This certifies that

(NAME OF OPERATOR)

has received the prescribed training in the operation of powder actuated tools manufactured by

(NAME OF MANUFACTURER)

Model(s)

Trained and issued by

(SIGNATURE OF AUTHORIZED INSTRUCTOR)

I have received instruction in the safe operation and maintenance of powder actuated fastening tools of the makes and models specified and agree to conform to all rules and regulations governing that use

Date of Birth

(SIGNATURE)

Figure G-2

Sample of Qualified Operation's Card

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-36321, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-36321, filed 1/21/86.]

WAC 296-155-365 Abrasive wheels and tools. (1)

Power. All grinding machines shall be supplied with sufficient power to maintain the spindle speed at safe levels under all conditions of normal operation.

(2) Guarding.

(a) Grinding machines shall be equipped with safety guards in conformance with the requirements of American National Standards Institute, B7.1-1978, Safety Code for the Use, Care and Protection of Abrasive Wheels.

(b) Guard design. The safety guard shall cover the spindle end, nut, and flange projections. The safety guard shall be mounted so as to maintain proper alignment with the wheel, and the strength of the fastenings shall exceed the strength of the guard, except:

(i) Safety guards on all operations where the work provides a suitable measure of protection to the operator, may be so constructed that the spindle end, nut, and outer flange are exposed; and where the nature of the work is such as to

entirely cover the side of the wheel, the side covers of the guard may be omitted; and

(ii) The spindle end, nut, and outer flange may be exposed on machines designed as portable saws.

(3) Use of abrasive wheels.

(a) Floor stand and bench mounted abrasive wheels, used for external grinding, shall be provided with safety guards (protection hoods). The maximum angular exposure of the grinding wheel periphery and sides shall be not more than 90°, except that when work requires contact with the wheel below the horizontal plane of the spindle, the angular exposure shall not exceed 125°. In either case, the exposure shall begin not more than 65° above the horizontal plane of the spindle. Safety guards shall be strong enough to withstand the effect of a bursting wheel.

(b) Floor and bench-mounted grinders shall be provided with work rests which are rigidly supported and readily adjustable. Such work rests shall be adjusted to a distance not to exceed one-eighth inch from the surface of the wheel. The work rest may be omitted when contacts of the work piece with the grinding surface below the horizontal plane of the spindle are necessary and unavoidable, or where the size or shape of the work piece precludes use of the work rest.

(c) Cup type wheels used for external grinding shall be protected by either a revolving cup guard or a band type guard in accordance with the provisions of the American National Standards Institute, B7.1-1978, Safety Requirements for the Use, Care, and Protection of Abrasive Wheels. Abrasive wheels shall only be used on machines provided with safety guards, except the following:

(i) Wheels used for internal work while within the work being ground.

(ii) Mounted wheels, 2 inches and smaller in diameter used in portable operations.

(iii) Types 16, 17, 18, 18R and 19 cones and plugs, and threaded hole pot balls where the work offers protection or where the size does not exceed 3 inches in diameter by 5 inches in length.

(iv) Metal centered diamond lapidary wheels either notched, segmented or continuous rim used with a coolant deflector, when operated at speeds up to 3500 surface feet per minute (S.F.P.M.).

(v) Type 1 wheels not larger than 2 inches in diameter and not more than 1/2 inch thick, operating at peripheral speeds less than 1800 SFPM when mounted on mandrels driven by portable drills.

(vi) Type 1 reinforced wheels not more than 3 inches in diameter and 1/4 inch in thickness, operating at peripheral speeds not exceeding 9500 SFPM, provided that safety glasses and face shield are worn.

(vii) Valve seat grinding wheels.

(d) Portable abrasive wheels used for internal grinding shall be provided with safety flanges (protection flanges) meeting the requirements of subdivision (f) of this subsection, except as follows:

(i) When wheels 2 inches or less in diameter which are securely mounted on the end of a steel mandrel are used;

(ii) If the wheel is entirely within the work being ground while in use.

(e) When safety guards are required, they shall be so mounted as to maintain proper alignment with the wheel, and the guard and its fastenings shall be of sufficient strength to retain fragments of the wheel in case of accidental breakage. The maximum angular exposure of the grinding wheel periphery and sides shall not exceed 180°.

(f) When safety flanges are required, they shall be used only with wheels designed to fit the flanges. Only safety flanges, of a type and design and properly assembled so as to ensure that the pieces of the wheel will be retained in case of accidental breakage, shall be used.

(g) All abrasive wheels shall be closely inspected and ring-tested before mounting to ensure that they are free from cracks or defects.

(h) Grinding wheels shall fit freely on the spindle and shall not be forced on. The spindle nut shall be tightened only enough to hold the wheel in place.

(i) All employees using abrasive wheels shall be protected by eye protection equipment in accordance with the requirements of Part C of this chapter, except when adequate eye protection is afforded by eye shields which are permanently attached to the bench or floor stand.

(4) Other requirements. All abrasive wheels and tools used by employees shall meet other applicable requirements of American National Standards Institute, B7.1-1978, Safety Code for the Use, Care and Protection of Abrasive Wheels.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-365, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-365, filed 1/21/86; Order 74-26, § 296-155-365, filed 5/7/74, effective 6/6/74.]

WAC 296-155-367 Masonry saws. (1) Guarding.

(a) Masonry saws shall be guarded by semicircular enclosures over the blade.

(b) A method for retaining blade fragments shall be incorporated into the design of the semicircular enclosure.

(2) Safety latch. A safety latch shall be installed on notched saws to prevent the motor and cutting head assembly from lifting out of the notches.

(3) Blade speed. Blade speed shall be maintained in accordance with the manufacturer's specifications.

(4) Exhaust and eye protection.

(a) All table mounted masonry saws shall be equipped with a mechanical means of exhausting dust into a covered receptacle or be provided with water on the saw blade for dust control. The operator and any nearby worker shall wear appropriate eye protection in accordance with WAC 296-155-215.

(b) All portable hand-held masonry saw operators shall wear appropriate eye and respiratory protection in accordance with WAC 296-155-215 and chapter 296-62 WAC.

(5) Grounding. The motor frames of all stationary saws shall be grounded through conduit, water pipe, or a driven ground. Portable saws shall be grounded through three-pole cords attached to grounded electrical systems.

(6) Inspection. Masonry saws shall be inspected at regular intervals and maintained in safe operating condition.

[Statutory Authority: Chapter 49.17 RCW, 90-17-051 (Order 90-10), § 296-155-367, filed 8/13/90, effective 9/24/90. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-367, filed 1/21/86.]

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WAC 296-155-370 Woodworking tools. (1) Speeds. No saw shall be operated in excess of the manufacturers recommended speed.

(2) Guarding. All portable, hand held power-driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.

(3) Hand-fed table saws.

(a) Each circular hand-fed table saw shall be provided with a hood-type guard that will cover the blade at all times when the blade is not in use. This may be accomplished by the use of a guard that will automatically adjust to the thickness of the material being cut, or by a fixed or manually adjusted guard. If a fixed or manually adjusted guard is used, the space between the bottom of the guard and the material being cut shall not exceed 3/8 inch if 1-1/2 inches or more from the blade, and 1/4 inch if closer than 1-1/2 inches.

(b) When the blade is in use, the hood-type guard shall enclose that portion of the blade above the material.

(c) Hood-type guards shall be so designed and constructed as to resist blows and strains incidental to reasonable operation, adjusting, and handling, in order to protect the operator from flying splinters and broken saw teeth.

(d) The hood shall be so mounted as to ensure that its operation will be positive, reliable, and in alignment with the saw. The mounting shall be adequate to resist any reasonable side thrust or other force that would disrupt alignment.

(e) Where a hood-type guard cannot be used because of unusual shapes or cuts, a jig or fixture that will provide equal safety for the operator shall be used. On the completion of such operations, the guard shall be immediately replaced.

(f) A push stick shall be used on short or narrow stock when there is a possibility of the hand contacting the cutting tool.

(g) Each hand-fed circular rip saw shall be equipped with a spreader to minimize the possibility of material squeezing the saw or of material kickbacks. The spreader shall be made of tempered steel, or its equivalent, and shall be slightly thinner than the saw kerf. It shall be of sufficient width to provide adequate stiffness or rigidity to resist any reasonable side thrust or blow tending to bend or throw it out of position. The spreader shall be attached so that it will remain in true alignment with the blade, even when either the saw or table is tilted, and should be placed so that there is not more than 1/2-inch space between the spreader and the back of the blade when the recommended saw blade is in its maximum "up" position. If a blade smaller than the maximum permissible size is used, the spreader shall be moved to within 1/2 inch of the blade. The provision of a spreader in connection with grooving, dadoing, or rabbeting is not required. On the completion of such operations, the spreader shall be immediately replaced.

(h) Each hand-fed circular rip saw shall be provided with antikickback devices so located as to oppose the thrust or ten-

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gency of the saw blade to pick up the material or throw it back toward the operator. These devices shall be designed to provide holding power for all the thicknesses of material being cut.

(4) Radial saws.

(a) Hoods and guards. Each saw shall be provided with a device that will completely enclose the upper portion of the blade down to a point that includes the end of the saw arbor. The upper hood shall be so constructed as to protect the operator from flying splinters and broken saw teeth, and to deflect sawdust away from the operator. The sides of the lower exposed portion of the saw blade shall be guarded from the tips of the blade teeth inward radially with no greater than 3/8-inch gullet exposure. The device shall automatically adjust itself to the thickness of the stock and remain in contact with the stock being cut for the 90° blade positions (0° bevel) throughout the full working range of miter position. A permanent label not less than 1-1/2 inches X 3/4 inch shall be affixed to the guard visible from the normal operating position, reading as follows:

WARNING: TO AVOID INJURY, SHUT OFF POWER BEFORE CLEARING A JAMMED LOWER GUARD

Such a label shall be colored standard danger red or orange in accordance with American National Standard Safety Color Code for Marking Physical Hazards, Z53.1-1979.

(b) Spreaders. When radial saws are used for ripping, a spreader shall be provided and shall be aligned with the saw blade.

(c) Antikickback devices. Antikickback devices located on both sides of the saw blade on the outfeed side, so as to oppose the thrust or tendency of the blade to pick up the material or to throw it back toward the operator, shall be used on each radial saw used for ripping. These devices shall be designed to provide adequate holding power for all the thicknesses of material being cut.

(d) Adjustable stops and return devices. An adjustable stop shall be provided to prevent the forward travel of the blade beyond the position necessary to complete the cut. A limit chain or other equally effective device shall be provided to prevent the saw blade from sliding beyond the edge of the table; or the table shall be extended to eliminate over-run.

(e) On any manually operated saw, installation shall be such that the front of the machine is slightly higher than the rear, or some other means shall be provided so that the cutting head will not roll or move out on the arm away from the column as a result of gravity or vibration. A permanent label not less than 1-1/2 inches X 3/4 inch shall be affixed to the cutting head visible from the normal crosscut operating position, reading as follows:

WARNING: TO AVOID INJURY, RETURN CARRIAGE TO THE FULL REAR POSITION AFTER EACH CROSSCUT TYPE OF OPERATION

Such a label shall be colored standard caution yellow in accordance with American National Standard Z53.1-1979.

(f) Direction of feed. Ripping and ploughing shall be against the direction in which the saw blade turns. The direction of the saw blade rotation shall be conspicuously marked on the hoods. In addition, a permanent label not less than 1-

1/2 inches X 3/4 inch shall be affixed to the end of the guard at which the blade teeth exit the upper guard during operation. The label shall be at approximately the level of the arbor and shall read as follows:

DANGER: TO AVOID INJURY, DO NOT FEED MATERIAL INTO CUTTING TOOL FROM THIS END

Such a label shall be colored standard red or orange in accordance with American National Standard, Z53.1-1979.

(5) All woodworking tools and machinery shall meet any other applicable requirements of American National Standards Institute, 01.1-1971, Safety Code for Woodworking Machinery.

(6) The control switch on all stationary radial arm saws shall be placed at the front of the saw or table and shall be properly recessed or hooded to prevent accidental contact.

(a) A firm level working area shall be provided at the front of all stationary radial arm saws. The area shall be kept free of all stumbling hazards.

(b) A push stick or similar device shall be used for pushing short material through power saws.

(7) Circular power miter saws. The requirements of subsection (4)(a) of this section applies to guarding circular power miter saws.

(8) Personal protective equipment. All personal protective equipment required for use shall conform to the requirements of Part C of this chapter.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-370, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-370, filed 1/21/86; Order 74-26, § 296-155-370, filed 5/7/74, effective 6/6/74.]

WAC 296-155-375 Jacks—Lever and ratchet, screw, and hydraulic. General requirements.

(1) The manufacturer's rated capacity shall be legibly marked on all jacks and this capacity shall not be exceeded.

(2) All jacks shall have a positive stop to prevent over-travel.

(3) Specially designed jacks constructed for specific purposes shall meet the approval of the department of labor and industries before being placed in service.

(4) Control parts shall be so designed that the operator will not be subjected to hazard.

(5) Blocking. When it is necessary to provide a firm foundation, the base of the jack shall be blocked or cribbed. Where there is a possibility of slippage of the metal cap of the jack, a wood block shall be placed between the cap and the load.

(6) Operation and maintenance.

(a) After the load has been raised, it shall immediately be cribbed, blocked, or otherwise secured.

(b) Hydraulic jacks exposed to freezing temperatures shall be supplied with an adequate antifreeze liquid.

(c) All jacks shall be properly lubricated at regular intervals. The lubricating instructions of the manufacturer should be followed, and only lubricants recommended by the manufacturer should be used.

(7) Each jack shall be thoroughly inspected at times which depend upon the service conditions. Inspections shall be not less frequent than the following:

(a) For constant or intermittent use at one locality, once every six months;

(b) For jacks sent out of shop for special work, when sent out and when returned;

(c) For a jack subjected to abnormal load or shock, immediately before and immediately thereafter.

(8) Repair or replacement parts shall be examined for possible defects.

(9) Jacks which are out of order shall be tagged accordingly, and shall not be used until repairs are made.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-375, filed 7/20/94, effective 9/20/94; 93-04-111 (Order 92-15), § 296-155-375, filed 2/3/93, effective 3/15/93; 91-11-070 (Order 91-01), § 296-155-375, filed 5/20/91, effective 6/20/91; Order 74-26, § 296-155-375, filed 5/7/74, effective 6/6/74.]

WAC 296-155-380 Air receivers. (1) Application. This section applies to compressed air receivers, and other equipment used in providing and utilizing compressed air for performing operations such as cleaning, drilling, hoisting, and chipping. On the other hand, however, this section does not deal with the special problems created by using compressed air to convey materials nor the problems created when persons work in compressed air as in tunnels and caissons. These standards are not intended to apply to compressed air machinery and equipment used on transportation vehicles such as steam railroad cars, electric railway cars, and automotive equipment.

(2) New and existing equipment.

(a) All new air receivers installed after the effective date of these standards shall be constructed in accordance with the 1968 Edition of the A.S.M.E. Boiler and Pressure Vessel Code, section VIII.

(b) All safety valves used shall be constructed, installed, and maintained in accordance with the A.S.M.E. Boiler and Pressure Vessel Code, section VIII Edition 1968.

(3) Installation. Air receivers shall be so installed that all drains, handholes, and manholes therein are easily accessible. Air receivers should be supported with sufficient clearance to permit a complete external inspection and to avoid corrosion of external surfaces. Under no circumstances shall an air receiver be buried underground or located in an inaccessible place. The receiver should be located as close to the compressor or after-cooler as is possible in order to keep the discharge pipe short.

(4) Drains and traps. All air receivers having an internal and external operating pressure exceeding 15 psi with no limitation on size, and air receivers having an inside diameter exceeding six inches, with no limitation on pressure, if subject to corrosion, shall be supplied with a drain pipe and valve at the lowest point in the vessel; or a pipe may be used extending inward from any other location to within one-quarter inch of the lowest point. Adequate automatic traps may be installed in addition to drain valves. The drain valve on the air receiver shall be opened and the receiver completely drained frequently and at such intervals as to prevent the accumulation of oil and water in the receiver.

(5) Gages and valves.

(a) Every air receiver shall be equipped with an indicating pressure gage (so located as to be readily visible) and with one or more spring-loaded safety valves. The total

relieving capacity of such safety valves shall be such as to prevent pressure in the receiver from exceeding the maximum allowable working pressure of the receiver by more than ten percent.

(b) No valve of any type shall be placed between the air receiver and its safety valve or valves.

(c) Safety appliances, such as safety valves, indicating devices and controlling devices, shall be constructed, located, and installed so that they cannot be readily rendered inoperative by any means, including the elements.

(d) All safety valves shall be tested frequently and at regular intervals to determine whether they are in good operating condition.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-380, filed 7/20/94, effective 9/20/94.]

PART H WELDING AND CUTTING

WAC 296-155-400 Gas welding and cutting. (1) Transporting, moving, and storing compressed gas cylinders.

(a) Valve protection caps shall be in place and secured.

(b) When cylinders are hoisted, they shall be secured on a cradle, slingboard, or pallet. They shall not be hoisted or transported by means of magnets or choker slings.

(c) Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dropped, struck, or permitted to strike each other violently.

(d) When cylinders are transported by powered vehicles, they shall be secured in a vertical position.

(e) Valve protection caps shall not be used for lifting cylinders from one vertical position to another. Bars shall not be used under valves or valve protection caps to pry cylinders loose when frozen. Warm, not boiling, water shall be used to thaw cylinders loose.

(f) Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators shall be removed and valve protection caps put in place before cylinders are moved.

(g) A suitable cylinder truck, chain, or other steadying device shall be used to keep cylinders from being knocked over while in use. Such cylinders are not considered to be "in storage."

(h) When a job is finished, when cylinders are empty or when cylinders are moved at any time, the cylinder valve shall be closed.

(i) Compressed gas cylinders shall be secured in an upright position at all times except, if necessary, for short periods of time while cylinders are actually being hoisted or carried.

(j) Oxygen. Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum distance of 20 feet or by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.

(2) Placing cylinders.

(a) Cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them. When this is impractical, fire resistant shields shall be provided.

(b) Cylinders shall be placed where they cannot become part of an electrical circuit. Electrodes shall not be struck against a cylinder to strike an arc.

(c) Fuel gas cylinders shall be placed with valve end up whenever they are in use. They shall not be placed in a location where they would be subject to open flame, hot metal, or other sources of artificial heat.

(d) Cylinders containing oxygen or acetylene or other fuel gas shall not be taken into confined spaces.

(3) Treatment of cylinders.

(a) Cylinders, whether full or empty, shall not be used as rollers or supports.

(b) No person other than the gas supplier shall attempt to mix gases in a cylinder. No one except the owner of the cylinder or person authorized by the owner, shall refill a cylinder. No one shall use a cylinder's contents for purposes other than those intended by the supplier. All cylinders used shall meet the department of transportation requirements, Specification for Cylinders, (49 CFR Part 178, Subpart C).

(c) No damaged or defective cylinder shall be used.

(4) Use of fuel gas. The employer shall thoroughly instruct employees in the safe use of fuel gas, as follows:

(a) Before a regulator to a cylinder valve is connected, the valve shall be opened slightly and closed immediately. (This action is generally termed "cracking" and is intended to clear the valve of dust or dirt that might otherwise enter the regulator.) The person cracking the valve shall stand to one side of the outlet, not in front of it. The valve of a fuel gas cylinder shall not be cracked where the gas would reach welding work, sparks, flame, or other possible sources of ignition.

(b) The cylinder valve shall always be opened slowly to prevent damage to the regulator. For quick closing, valves on fuel gas cylinders shall not be opened more than 1 1/2 turns. When a special wrench is required, it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel gas flow can be shut off quickly in case of an emergency. In the case of manifolded or coupled cylinders, at least one such wrench shall always be available for immediate use. Nothing shall be placed on top of a fuel gas cylinder, when in use, which may damage the safety device or interfere with the quick closing of the valve.

(c) Fuel gas shall not be used from cylinders through torches or other devices which are equipped with shutoff valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.

(d) Before a regulator is removed from a cylinder valve, the cylinder valve shall always be closed and the gas released from the regulator.

(e) If, when the valve on a fuel gas cylinder is opened, there is found to be a leak around the valve stem, the valve shall be closed and the gland nut tightened. If this action does not stop the leak, the use of the cylinder shall be discontinued, and it shall be properly tagged and removed from the work area. In the event that fuel gas should leak from the cylinder valve, rather than from the valve stem, and the gas cannot be shut off, the cylinder shall be properly tagged and removed from the work area. If a regulator attached to a cylinder valve will effectively stop a leak through the valve seat, the cylinder need not be removed from the work area.

(f) If a leak should develop at a fuse plug or other safety device, the cylinder shall be removed from the work area.

(g) Cylinders not having fixed hand wheels shall have keys, handles, or nonadjustable wrenches on valve stems while in service. In multiple cylinder installations one and only one key or handle is required for each manifold.

(5) Fuel gas and oxygen manifolds.

(a) Fuel gas and oxygen manifolds shall bear the name of the substance they contain in letters at least 1-inch high which shall be either painted on the manifold or on a sign permanently attached to it.

(b) Fuel gas and oxygen manifolds shall be placed in safe, well ventilated, and accessible locations. They shall not be located within enclosed spaces.

(c) Manifold hose connections, including both ends of the supply hose that lead to the manifold, shall be such that the hose cannot be interchanged between fuel gas and oxygen manifolds and supply header connections. Adapters shall not be used to permit the interchange of hose. Hose connections shall be kept free of grease and oil.

(d) When not in use, manifold and header hose connections shall be capped.

(e) Nothing shall be placed on top of a manifold, when in use, which will damage the manifold or interfere with the quick closing of the valves.

(6) Hose.

(a) Fuel gas hose and oxygen hose shall be easily distinguishable from each other. The contrast may be made by different colors or by surface characteristics readily distinguishable by the sense of touch. Oxygen and fuel gas hoses shall not be interchangeable. A single hose having more than one gas passage shall not be used.

(b) When parallel sections of oxygen and fuel gas hose are taped together, not more than 4 inches out of 12 inches shall be covered by tape.

(c) All hose in use, carrying acetylene, oxygen, natural or manufactured fuel gas, or any gas or substance which may ignite or enter into combustion, or be in any way harmful to employees, shall be inspected at the beginning of each working shift. Defective hose shall be removed from service.

(d) Hose which has been subject to flashback, or which shows evidence of severe wear or damage, shall be tested to twice the normal pressure to which it is subject, but in no case less than 300 p.s.i. Defective hose, or hose in doubtful condition, shall not be used.

(e) Hose couplings shall be of the type that cannot be unlocked or disconnected by means of a straight pull without rotary motion.

(f) Boxes used for the storage of gas hose shall be ventilated.

(g) Hoses, cables, and other equipment shall be kept clear of passageways, ladders and stairs.

(7) Torches.

(a) Clogged torch tip openings shall be cleaned with suitable cleaning wires, drills, or other devices designed for such purpose.

(b) Torches in use shall be inspected at the beginning of each working shift for leaking shutoff valves, hose couplings, and tip connections. Defective torches shall not be used.

(c) Torches shall be lighted by friction lighters or other approved devices, and not by matches or from hot work.

(8) Regulators and gauges. Oxygen and fuel gas pressure regulators, including their related gauges, shall be in proper working order while in use.

(9) Oil and grease hazards. Oxygen cylinders and fittings shall be kept away from oil or grease. Cylinders, cylinder caps and valves, couplings, regulators, hose, and apparatus shall be kept free from oil or greasy substances and shall not be handled with oily hands or gloves. Oxygen shall not be directed at oily surfaces, greasy clothes, or within a fuel oil or other storage tank or vessel.

(10) Additional rules. For additional details not covered in this Part, applicable portions of American National Standards Institute, Z49.1-1973, Safety in Welding and Cutting, shall apply.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-400, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-400, filed 1/21/86; Order 74-26, § 296-155-400, filed 5/7/74, effective 6/6/74.]

WAC 296-155-405 Arc welding and cutting. (1) Manual electrode holders.

(a) Only manual electrode holders which are specifically designed for arc welding and cutting, and are of a capacity capable of safely handling the maximum rated current required by the electrodes, shall be used.

(b) Any current-carrying parts passing through the portion of the holder which the arc welder or cutter grips in the hand, and the outer surfaces of the jaws of the holder, shall be fully insulated against the maximum voltage encountered to ground.

(2) Welding cables and connectors.

(a) All arc welding and cutting cables shall be of the completely insulated, flexible type, capable of handling the maximum current requirements of the work in progress, taking into account the duty cycle under which the arc welder or cutter is working.

(b) Only cable free from repair or splices for a minimum distance of 10 feet from the cable end to which the electrode holder is connected shall be used, except that cables with standard insulated connectors or with splices whose insulating quality is equal to that of the cable are permitted.

(c) When it becomes necessary to connect or splice lengths of cable one to another, substantial insulated connectors of a capacity at least equivalent to that of the cable shall be used. If connections are effected by means of cable lugs, they shall be securely fastened together to give good electrical contact, and the exposed metal parts of the lugs shall be completely insulated.

(d) Cables in need of repair shall not be used. When a cable, other than the cable lead referred to in subdivision (b) of this subsection, becomes worn to the extent of exposing bare conductors, the portion thus exposed shall be protected by means of rubber and friction tape or other equivalent insulation.

(3) Ground returns and machine grounding.

(a) A ground return cable shall have a safe current carrying capacity equal to or exceeding the specified maximum output capacity of the arc welding or cutting unit which it services. When a single ground return cable services more than

one unit, its safe current-carrying capacity shall equal or exceed the total specified maximum output capacities of all the units which it services.

(b) Pipelines containing gases or flammable liquids, or conduits containing electrical circuits, shall not be used as a ground return. For welding on natural gas pipelines, the technical portions of regulations issued by the Department of Transportation, Office of Pipeline Safety, Minimum Federal Safety Standards for Gas Pipelines shall apply. (49 CFR Part 192, Subpart C.)

(c) When a structure or pipeline is employed as a ground return circuit, it shall be determined that the required electrical contact exist at all joints. The generation of an arc, sparks, or heat at any point shall cause rejection of the structures as a ground circuit.

(d) When a structure or pipeline is continuously employed as a ground return circuit, all joints shall be bonded, and periodic inspections shall be conducted to ensure that no condition of electrolysis or fire hazard exists by virtue of such use.

(e) The frames of all arc welding and cutting machines shall be grounded either through a third wire in the cable containing the circuit conductor or through a separate wire which is grounded at the source of the current. Grounding circuits, other than by means of the structure, shall be checked to ensure that the circuit between the ground and the grounded power conductor has resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

(f) All ground connections shall be inspected to ensure that they are mechanically strong and electrically adequate for the required current.

(4) Operating instructions. Employers shall instruct employees in the safe means of arc welding and cutting as follows:

(a) When electrode holders are to be left unattended, the electrodes shall be removed and the holders shall be so placed or protected that they cannot make electrical contact with employees or conducting objects.

(b) Hot electrode holders shall not be dipped in water; to do so may expose the arc welder or cutter to electric shock.

(c) When the arc welder or cutter has occasion to leave work or to stop work for any appreciable length of time, or when the arc welding or cutting machine is to be moved, the power supply switch to the equipment shall be opened.

(d) Any faulty or defective equipment shall be reported to the supervisor.

(e) See WAC 296-155-452 for additional requirements.

(5) Shielding. Whenever practical, all arc welding and cutting operations shall be shielded by noncombustible or flameproof screens which will protect employees and other persons working in the vicinity from the direct rays of the arc.

(6) Employee protection. Where welding or cutting operations are being performed in areas where it is possible for molten slag to contact other employees, those employees shall be protected from being burned by providing overhead protection, barricading the impact area, or other effective means.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-405, filed 7/20/94, effective 9/20/94; 88-23-054 (Order 88-25), § 296-

155-405, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-405, filed 1/21/86; Order 74-26, § 296-155-405, filed 5/7/74, effective 6/6/74.]

WAC 296-155-407 Protective clothing. (1) General requirements. Employees exposed to the hazards created by welding, cutting, or brazing operations shall be protected by personal protective equipment in accordance with the requirements of chapter 296-24 WAC, Part A-2 and Part I. Appropriate protective clothing required for any welding operation will vary with the size, nature and location of the work to be performed.

(2) Specified protective clothing. Protective means which may be employed are as follows:

(a) Except when engaged in light work, all welders should wear flameproof gauntlet gloves.

(b) Flameproof aprons made of leather, or other suitable material may also be desirable as protection against radiated heat and sparks.

(c) Woolen clothing preferable to cotton because it is not so readily ignited and helps protect the welder from changes in temperature. Cotton clothing, if used, should be chemically treated to reduce its combustibility. All outer clothing such as jumpers or overalls should be reasonably free from oil or grease.

(d) Sparks may lodge in rolled-up sleeves or pockets of clothing, or cuffs of overalls or trousers. It is therefore recommended that sleeves and collars be kept buttoned and pockets be eliminated from the front of overalls and aprons. Trousers or overalls should not be turned up on the outside.

Note: For heavy work, fire-resistant leggings, high boots, or other equivalent means should be used.

(e) In production work a sheet metal screen in front of the worker's legs can provide further protection against sparks and molten metal in cutting operations.

(f) Capes or shoulder covers made of leather or other suitable materials should be worn during overhead welding or cutting operations. Leather skull caps may be worn under helmets to prevent head burns.

(g) Where there is exposure to sharp or heavy falling objects, or a hazard of bumping in confined spaces, hard hats or head protectors shall be used.

[Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-155-407, filed 1/18/95, effective 3/1/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-407, filed 1/21/86.]

WAC 296-155-410 Fire prevention. (1) When practical, objects to be welded, cut, or heated shall be moved to a designated safe location or, if the objects to be welded, cut, or heated cannot be readily moved, all movable fire hazards in the vicinity shall be taken to a safe place, or otherwise protected.

(2) If the object to be welded, cut, or heated cannot be moved and if all the fire hazards cannot be removed, positive means shall be taken to confine the heat, sparks, and slag, and to protect the immovable fire hazards from them.

(3) No welding, cutting, or heating shall be done where the application of flammable paints, or the presence of other flammable compounds, or heavy dust concentrations creates a hazard.

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(4) Suitable fire extinguishing equipment shall be immediately available in the work area and shall be maintained in a state of readiness for instant use.

(5) When the welding, cutting, or heating operation is such that normal fire prevention precautions are not sufficient, additional personnel shall be assigned to guard against fire while the actual welding, cutting, or heating operation is being performed, and for a sufficient period of time after completion of the work to ensure that no possibility of fire exists. Such personnel shall be instructed as to the specific anticipated fire hazards and how the firefighting equipment provided is to be used.

(6) When welding, cutting, or heating is performed on walls, floors, and ceilings, since direct penetration of sparks or heat transfer may introduce a fire hazard to an adjacent area, the same precautions shall be taken on the opposite side as are taken on the side on which the welding is being performed.

(7) For the elimination of possible fire in enclosed spaces as a result of gas escaping through leaking or improperly closed torch valves, the gas supply to the torch shall be positively shut off at some point outside the enclosed space whenever the torch is not to be used or whenever the torch is left unattended for a substantial period of time, such as during the lunch period. Overnight and at the change of shifts, the torch and hose shall be removed from the confined space. Open end fuel gas and oxygen hoses shall be immediately removed from enclosed spaces when they are disconnected from the torch or other gas-consuming device.

(8) Except when the contents are being removed or transferred, drums, pails, and other containers, which contain or have contained flammable liquids, shall be kept closed. Empty containers shall be removed to a safe area apart from hot work operations or open flames.

(9) Drums, containers, or hollow structures which have contained toxic or flammable substances shall, before welding, cutting, or heating is undertaken on them, either be filled with water or thoroughly cleaned of such substances and ventilated and tested. For welding, cutting and heating on steel pipelines containing natural gas, the pertinent portions of regulations issued by the Department of Transportation, Office of Pipeline Safety, Minimum Federal Safety Standards for Gas Pipelines, shall apply. (49 CFR Part 192, Subpart C.)

(10) Before heat is applied to a drum, container, or hollow structure, a vent or opening shall be provided for the release of any built-up pressure during the application of heat.

[Order 74-26, § 296-155-410, filed 5/7/74, effective 6/6/74.]

WAC 296-155-415 Ventilation and protection in welding, cutting, and heating. (1) Mechanical ventilation. For purposes of this section, mechanical ventilation shall meet the following requirements:

(a) Mechanical ventilation shall consist of either general mechanical ventilation systems or local exhaust systems.

(b) General mechanical ventilation shall be of sufficient capacity and so arranged as to produce the number of air changes necessary to maintain welding fumes and smoke within safe limits, as defined in Part B of this chapter.

(1999 Ed.)

(c) Local exhaust ventilation shall consist of freely movable hoods intended to be placed by the welder or burner as close as practicable to the work. This system shall be of sufficient capacity and so arranged as to remove fumes and smoke at the source and keep the concentration of them in the breathing zone within safe limits as defined in Part B of this chapter.

(d) Contaminated air exhausted from a working space shall be discharged into the open air or otherwise clear of the source of intake air.

(e) All air replacing that withdrawn shall be clean and respirable.

(f) Oxygen shall not be used for ventilation purposes, comfort cooling, blowing dust from clothing, or for cleaning the work area.

(2) Welding, cutting, and heating in confined spaces.

(a) Except as provided in subdivision (b) of this subsection and subdivision (b) of subsection (3) of this section, either general mechanical or local exhaust ventilation meeting the requirements of subsection (1) of this section shall be provided whenever welding, cutting, or heating is performed in a confined space.

(b) When sufficient ventilation cannot be obtained without blocking the means of access, employees in the confined space shall be protected by air line respirators in accordance with the requirements of Part C of this chapter, and an employee on the outside of such a confined space shall be assigned to maintain communication with those working within it and to aid them in an emergency.

(3) Welding, cutting, or heating of metals of toxic significance.

(a) Welding, cutting, or heating in any enclosed spaces involving the metals specified in this subsection shall be performed with either general mechanical or local exhaust ventilation meeting the requirements of subsection (1) of this section:

(i) Zinc-bearing base or filler metals or metals coated with zinc-bearing materials.

(ii) Lead base metals;

(iii) Cadmium-bearing filler materials;

(iv) Chromium-bearing metals or metals coated with chromium-bearing materials.

(b) Welding, cutting, or heating in any enclosed spaces involving the metals specified in this subdivision shall be performed with local exhaust ventilation in accordance with the requirements of subsection (1) of this section, or employees shall be protected by air line respirators in accordance with the requirements of Part C of this chapter.

(i) Metals containing lead, other than as an impurity, or metals coated with lead-bearing materials;

(ii) Cadmium-bearing or cadmium-coated base metals;

(iii) Metals coated with mercury-bearing metals;

(iv) Beryllium-containing base or filler metals. Because of its high toxicity, work involving beryllium shall be done with both local exhaust ventilation and air line respirators.

(c) Employees performing such operations in the open air shall be protected by filter-type respirators in accordance with the requirements of Part C of this chapter, except that employees performing such operations on beryllium-containing base or filler metals shall be protected by air line respira-

tors in accordance with the requirements of Part C of this chapter.

(d) Other employees exposed to the same atmosphere as the welders or burners shall be protected in the same manner as the welder or burner.

(4) Inert-gas metal-arc welding.

(a) Since the inert-gas metal-arc welding process involves the production of ultra-violet radiation of intensities of 5 to 30 times that produced during shielded metal-arc welding, the decomposition of chlorinated solvents by ultra-violet rays, and the liberation of toxic fumes and gases, employees shall not be permitted to engage in, or be exposed to the process until the following special precautions have been taken:

(i) The use of chlorinated solvents shall be kept at least 200 feet, unless shielded, from the exposed arc, and surfaces prepared with chlorinated solvents shall be thoroughly dry before welding is permitted on such surfaces.

(ii) Employees in the area not protected from the arc by screening shall be protected by filter lenses meeting the requirements of Part C of this chapter. When two or more welders are exposed to each other's arc, filter lens goggles of a suitable type, meeting the requirements of Part C of this chapter shall be worn under welding helmets. Hand shields to protect the welder against flashes and radiant energy shall be used when either the helmet is lifted or the shield is removed.

(iii) Welders and other employees who are exposed to radiation shall be suitably protected so that the skin is covered completely to prevent burns and other damage by ultra-violet rays. Welding helmets and hand shields shall be free of leaks and openings, and free of highly reflective surfaces.

(iv) When inert-gas metal-arc welding is being performed on stainless steel, the requirements of subdivision (b) of subsection (3) of this section shall be met to protect against dangerous concentrations of nitrogen dioxide.

(5) General welding, cutting, and heating.

(a) Welding, cutting, and heating, not involving conditions or materials described in subsections (2), (3), or (4) of this section, may normally be done without mechanical ventilation or respiratory protective equipment, but where, because of unusual physical or atmospheric conditions, an unsafe accumulation of contaminants exists, suitable mechanical ventilation or respiratory protective equipment shall be provided.

(b) Employees performing any type of welding, cutting, or heating shall be protected by suitable eye protective equipment in accordance with the requirements of Part C of this chapter.

[Order 74-26, § 296-155-415, filed 5/7/74, effective 6/6/74.]

WAC 296-155-420 Welding, cutting, and heating in way of preservative coatings. (1) Before welding, cutting, or heating is commenced on any surface covered by a preservative coating whose flammability is not known, a test shall be made by a competent person to determine its flammability. Preservative coatings shall be considered to be highly flammable when scrapings burn with extreme rapidity.

(2) Precautions shall be taken to prevent ignition of highly flammable hardened preservative coatings. When

coatings are determined to be highly flammable, they shall be stripped from the area to be heated to prevent ignition.

(3) Protection against toxic preservative coatings:

(a) In enclosed spaces, all surfaces covered with toxic preservatives shall be stripped of all toxic coatings for a distance of at least 4 inches from the area of heat application, or the employees shall be protected by air line respirators, meeting the requirements of Part C of this chapter.

(b) In the open air, employees shall be protected by a respirator, in accordance with requirements of Part C of this chapter.

(4) The preservative coatings shall be removed a sufficient distance from the area to be heated to ensure that the temperature of the unstripped metal will not be appreciably raised. Artificial cooling of the metal surrounding the heating area may be used to limit the size of the area required to be cleaned.

[Order 74-26, § 296-155-420, filed 5/7/74, effective 6/6/74.]

PART I ELECTRICAL

WAC 296-155-426 Introduction. This part addresses electrical safety requirements that are necessary for the practical safeguarding of employees involved in construction work and is divided into four major divisions and applicable definitions as follows:

(1) Introduction and definitions. Definitions applicable to this part are contained in WAC 296-155-462.

(2) Installation safety requirements. Installation safety requirements are contained in WAC 296-155-441 through 296-155-459. Included in this category are electric equipment and installations used to provide electric power and light on jobsites.

(3) Safety-related work practices. Safety-related work practices are contained in WAC 296-155-428 and 296-155-429. In addition to covering the hazards arising from the use of electricity at jobsites, these regulations also cover the hazards arising from the accidental contact, direct or indirect, by employees with all energized lines, above or below ground, passing through or near the jobsite.

(4) Safety-related maintenance and environmental considerations. Safety-related maintenance and environmental considerations are contained in WAC 296-155-432 and 296-155-434.

(5) Safety requirements for special equipment. Safety requirements for special equipment are contained in WAC 296-155-437.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-426, filed 5/11/88.]

WAC 296-155-428 General requirements. (1) Protection of employees.

(a) No employer shall permit an employee to work in such proximity to any part of an electric power circuit that the employee could contact the electric power circuit in the course of work, unless the employee is protected against electric shock by de-energizing the circuit and grounding it or by guarding it effectively by insulation or other means.

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(b) No person, firm, corporation, or agent of same, shall require or permit any employee to perform any function in proximity to electrical conductors or to engage in any excavation, construction, demolition, repair, or other operation, unless and until danger from accidental contact with said electrical conductors has been effectively guarded by de-energizing the circuit and grounding it or by guarding it by effective insulation or other effective means.

(c) In work areas where the exact location of underground electric powerlines is unknown, no activity which may bring employees into contact with those powerlines shall begin until the powerlines have been positively and unmistakably de-energized and grounded.

(d) Before work is begun the employer shall ascertain by inquiry or direct observation, or by instruments, whether any part of an energized electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool, or machine into physical or electrical contact with the electric power circuit. The employer shall post and maintain proper warning signs where such a circuit exists. The employer shall advise employees of the location of such lines, the hazards involved, and the protective measures to be taken.

(e) No work shall be performed, no material shall be piled, stored or otherwise handled, no scaffolding, commercial signs, or structures shall be erected or dismantled, nor any tools, machinery or equipment operated within the specified minimum distances from any energized high voltage electrical conductor capable of energizing the material or equipment; except where the electrical distribution and transmission lines have been de-energized and visibly grounded at point of work, or where insulating barriers not a part of or an attachment to the equipment have been erected, to prevent physical contact with the lines, equipment shall be operated proximate to, under, over, by, or near energized conductors only in accordance with the following:

(i) For lines rated 50 kV. or below, minimum clearance between the lines and any part of the equipment or load shall be ten feet.

(ii) For lines rated over 50 kV. minimum, clearance between the lines and any part of the equipment or load shall be ten feet plus 0.4 inch or each 1 kV. over 50 kV., or twice the length of the line insulator but never less than ten feet.

(f) Work on energized equipment. Only qualified persons shall work on electric circuit parts of equipment that have not been deenergized under the procedures of WAC 296-155-429(4). Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

(g) Overhead electric lines. Where overhead electric conductors are encountered in proximity to a work area, the employer shall be responsible for:

(i) Ascertaining the voltage and minimum clearance distance required; and

(ii) Maintaining the minimum clearance distance; and

(iii) Ensuring that the requirements of this section are complied with.

(1999 Ed.)

(h) If relocation of the electrical conductors is necessary, arrangements shall be made with the owners of the lines for such relocation.

(i) Barriers.

(i) Barriers shall be of such character and construction as to effectively provide the necessary protection without creating other hazards or jeopardizing the operation of the electrical circuits.

(ii) Barriers installed within the ten feet clearance from conductors shall be installed only under the supervision of authorized and qualified persons and this shall include a representative of the electrical utility or owner involved.

(j) Exceptions.

(i) These rules do not apply to the construction, reconstruction, operation, and maintenance, of overhead electrical lines, structures, and associated equipment by authorized and qualified electrical workers.

(ii) These rules do not apply to authorized and qualified employees engaged in the construction, reconstruction, operation, and maintenance, of overhead electrical circuits or conductors and associated equipment of rail transportation systems or electrical generating, transmission, distribution and communication systems which are covered by chapters 296-45 and 296-32 WAC.

(k) Special precautions must be taken.

(i) When handling any winch lines, guy wires, or other free cable, wire or rope in the vicinity of any electrical conductors.

(ii) When pulling a winch line, or other cable or rope under energized electrical conductors from a boom, mast, pile driver, etc., in such a manner as to make possible an approach to within ten feet of a conductor.

(iii) When there is possibility of a winch line, cable, etc., either becoming disconnected or breaking under load because of excessive strain and flipping up into overhead conductors.

(iv) When placing steel, concrete reinforcement, wire mesh, etc.

(v) When handling pipe or rod sections in connection with digging wells or test holes.

(vi) When moving construction equipment, apparatus, machinery, etc., all such movements must avoid striking supporting structures, guy wires, or other elements of the electrical utility system causing the conductors to so swing or move as to decrease clearances to less than ten feet from construction equipment, or to cause them to come together.

(l) Warning sign required.

(i) An approved durable warning sign legible at twelve feet, reading "It is unlawful to operate this equipment within ten feet of electrical conductors" shall be posted and maintained in plain view of the operator at the controls of each crane, derrick, shovel, drilling rig, pile driver or similar apparatus which is capable of vertical, lateral or swinging motion.

(ii) A similar sign shall be installed on the outside of the equipment and located as to be readily visible to mechanics or other persons engaged in the work operation.

(iii) Signs shall be not less than 6" x 8" dimensions with the word "WARNING" or "DANGER" in large letters and painted red across the top and the other letters in black painted on yellow background.

(m) Any overhead wire shall be considered to be an energized line until the owner of such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.

(2) Passageways and open spaces.

(a) Barriers or other means of guarding shall be provided to ensure that workspace for electrical equipment will not be used as a passageway during periods when energized parts of electrical equipment are exposed.

(b) Working spaces, walkways, and similar locations shall be kept clear of cords so as not to create a tripping hazard to employees.

(3) Load ratings. In existing installations, no changes in circuit protection shall be made to increase the load in excess of the load rating of the circuit wiring.

(4) Fuses. When fuses are installed or removed with one or both terminals energized, special tools insulated for the voltage shall be used.

(5) Cords and cables.

(a) Worn or frayed electric cords or cables shall not be used.

(b) Extension cords shall not be fastened with staples, hung from nails, or suspended by wire.

(6) Interlocks. Only a qualified person following the requirements of this section may defeat an electrical safety interlock, and then only temporarily while they are working on the equipment. The interlock systems shall be returned to its operable condition when this work is completed.

(7) Portable electric equipment—Handling. Portable equipment shall be handled in a manner which will not cause damage. Flexible electric cords connected to equipment shall not be used for raising or lowering the equipment. Flexible cords shall not be fastened with staples or otherwise hung in such a fashion as could damage the outer jacket or insulation.

(8) Visual inspection. When an attachment plug is to be connected to a receptacle (including any on a cord set), the relationship of the plug and receptacle contacts shall first be checked to ensure they are of proper mating configurations.

(9) Connecting attachment plugs.

(a) Employees' hands shall not be wet when plugging and unplugging flexible cords and cord- and plug-connected equipment, if energized equipment is involved.

(b) Energized plug and receptacle connections shall be handled only with insulating protective equipment if the condition of the connection could provide a conducting path to the employee's hand (if, for example, a cord connector is wet from being immersed in water).

(c) Locking-type connectors shall be properly secured after connection.

(10) Routine opening and closing circuits. Load rated switches, circuit breakers, or other devices specifically designed as disconnecting means shall be used for the opening, reversing, or closing of circuits under load conditions. Cable connectors not of the load-break type, fuses, terminal lugs, and cable splice connections shall not be used for such purposes, except in an emergency.

(11) Reclosing circuits after protective device operation. After a circuit is deenergized by a circuit protective device, the circuit shall not be manually reenergized until it has been determined that the equipment and circuit can be safely ener-

gized. This repetitive manual reclosing of circuit breakers or reenergizing circuits through replaced fuses is prohibited.

Note: When it can be determined from the design of the circuit and the overcurrent devices involved that the automatic operation of a device was caused by an overload rather than a fault connection, no examination of the circuit or connected equipment is needed before the circuit is reenergized.

(12) Test instruments and equipment—Use. Only qualified persons shall perform testing work on electric circuits or equipment.

(13) Visual inspection. Test instruments and equipment and all associated test leads, cables, power cords, probes, and connectors shall be visually inspected for external defects and damage before the equipment is used. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee shall use it until necessary repairs and tests to render the equipment safe have been made.

(14) Rating of equipment. Test instruments and equipment and their accessories shall be rated for the circuits and equipment to which they will be connected and shall be designed for the environment in which they will be used.

(15) Occasional use of flammable or ignitable materials. Where flammable materials are present only occasionally, electric equipment capable of igniting them shall not be used, unless measures are taken to prevent hazardous conditions from developing. Such materials include, but are not limited to: Flammable gases, vapors, or liquids; combustible dust; and ignitable fibers or flyings.

(16) Work on energized equipment. Only qualified persons shall work on electric circuit parts of equipment that have not been deenergized under the procedures of WAC 296-155-429(4). Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

(17) Overhead lines. If work is to be performed near overhead lines, the lines shall be deenergized and grounded, or other protective measures shall be provided before work is started. If the lines are to be deenergized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to deenergize and ground them. If protective measures, such as guarding, isolating, or insulating, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

(18) Unqualified persons. When an unqualified person is working in an elevated position, or on the ground, near overhead lines, the location shall be such that the person and the longest conductive object they may contact cannot come closer to any unguarded, energized overhead line than the following distances:

(a) For voltages to ground 50kV or below—10 ft.;

(b) For voltages to ground over 50kV—10 ft. plus 0.4 inch for every 1kV over 50kV.

(19) Qualified persons. When a qualified person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person shall not approach or

take any conductive object without an approved insulating handle closer to exposed energized parts that are shown in subsection (1)(e) of this section unless:

(a) The person is insulated from the energized part (gloves, with sleeves if necessary), rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed; or

(b) The energized part is insulated both from all other conductive objects at a different potential and from the person; or

(c) The person is insulated from all conductive objects at a potential different from that of the energized part.

(20) Vehicular and mechanical equipment.

(a) Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 ft. is maintained. If the voltage is higher than 50kV, the clearance shall be increased 0.4 inch for every 1kV over the voltage. However, under any of the following conditions, the clearance may be reduced:

(i) If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. If the voltage is higher than 50kV, the clearance shall be increased 0.4 inch for every 1kV over that voltage.

(ii) If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

(b) If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in (a) through (d) of this subsection.

(c) Employees standing on the ground shall not contact the vehicle or mechanical equipment or any of its attachments, unless:

(i) The employee is using protective equipment rated for the voltage; or

(ii) The equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted in this section.

(d) If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is of grounding shall not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

(21) Illumination.

(a) Employees shall not enter spaces containing exposed energized parts, unless illumination is provided that enables the employees to perform the work safely.

(b) Where lack of illumination or an obstruction precludes observation of the work to be performed, employees shall not perform tasks near exposed energized parts.

Employees shall not reach blindly into areas which may contain energized parts.

(22) Confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, the employer shall provide, and the employee shall use, protective shields, protective barriers, or insulating materials as necessary to avoid inadvertent contact with these parts. Doors, hinged panels, and the like shall be secured to prevent their swinging into an employee and causing the employee to contact exposed energized parts.

(23) Conductive materials and equipment. Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee handle long dimensional conductive objects (such as ducts and pipes) practices (such as the use of insulation, guarding, and material handling techniques) which will minimize the hazard.

(24) Portable ladders. Portable ladders shall have non-conductive siderails if they are used where the employee or the ladder could contact exposed energized parts.

(25) Conductive apparel. Conductive articles of jewelry and clothing (such as watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) shall not be worn if they might contact exposed energized parts.

(26) Housekeeping duties.

(a) Where live parts present an electrical contact hazard, employees shall not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided.

(b) Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) shall not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-428, filed 7/20/94, effective 9/20/94; 92-23-017 (Order 92-13), § 296-155-428, filed 11/10/92, effective 12/18/92; 88-11-021 (Order 88-04), § 296-155-428, filed 5/11/88.]

WAC 296-155-429 Lockout and tagging of circuits.

(1) Controls. Controls that are deactivated during the course of work on energized or deenergized equipment or circuits shall be tagged and padlocked in the open position.

(2) Equipment and circuits. Equipment or circuits that are de-energized shall be rendered inoperative and have tags and locked padlocks attached at all points where such equipment or circuits can be energized.

(3) Tags. Tags shall be placed to identify plainly the equipment or circuits being worked on.

(4) Lockout and tagging. While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been deenergized, the circuits energizing the parts shall be locked out or tagged or both according to the requirements of this section. The requirements shall be followed in the order in which they are presented (i.e., (a) of this subsection first, then (b) of this subsection).

Note 1: As used in this section, fixed equipment refers to equipment fastened in connected by permanent wiring methods.

Note 2: Lockout and tagging procedures that comply with chapter 296-24 WAC, Part A-4 will also be deemed to comply with this subsection provided that:

1. The procedures address the electrical safety hazards covered by this part; and
2. The procedures also incorporate the requirements of (c)(iv) and (d)(ii) of this subsection.

(a) Procedures. The employer shall maintain a written copy of the procedures outlined in this subsection and shall make it available for inspection by employees and by the director and his/her authorized representative.

Note: The written procedures may be in the form of a copy of this section, WAC 296-155-429.

(b) Deenergizing equipment.

(i) Safe procedures for deenergizing circuits and equipment shall be determined before circuits or equipment are deenergized.

(ii) The circuits and equipment to be worked on shall be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches, and interlocks, shall not be used as the sole means for deenergizing circuits or equipment. Interlocks for electric equipment shall not be used as a substitute for lockout and tagging procedures.

(iii) Stored electric energy which might endanger personnel shall be released. Capacitors shall be discharged and high capacitance elements shall be short-circuited and grounded, if the stored electric energy might endanger personnel.

Note: If the capacitors or associated equipment are handled in meeting this requirement, they shall be treated as energized.

(iv) Stored nonelectrical energy in devices that could reenergize electric circuit parts shall be blocked or relieved to the extent that the circuit parts could not be accidentally energized by the device.

(c) Application of locks and tags.

(i) A lock and a tag shall be placed on each disconnecting means used to deenergize circuits and equipment on which work is to be performed, except as provided in (c)(iii) and (v) of this subsection. The lock shall be attached to prevent persons from operating the disconnecting means unless they resort to undue force or the use of tools.

(ii) Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.

(iii) If a lock cannot be applied, or if the employer can demonstrate that tagging procedures will provide a level of safety equivalent to that obtained by the use of a lock, a tag may be used without a lock.

(iv) A tag used without a lock, as permitted by item (iii) of this subsection, shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by the use of a lock. Examples of additional safety measures include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.

(v) A lock may be placed without a tag only under the following conditions:

(A) Only one circuit or piece of equipment is deenergized; and

(B) The lockout period does not extend beyond the work shifts; and

(C) Employees exposed to the hazards associated with reenergizing the circuit or equipment are familiar with this procedure.

(d) Verification of deenergized condition. The requirements of this subsection shall be met before any circuits or equipment can be considered and worked as deenergized.

(i) A qualified person shall operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.

(ii) A qualified person shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are deenergized. The test shall also determine if any energized conditions exist as a result of inadvertently induced voltage or unrelated voltage backfeed even though specific parts of the circuit have been deenergized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment shall be checked for proper operation immediately before and immediately after this test.

(e) Reenergizing equipment. These requirements shall be met, in the order given, before circuits or equipment are reenergized, even temporarily.

(i) A qualified person shall conduct tests and visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed, so that the circuits and equipment can be safely energized.

(ii) Employees exposed to the hazards associated with reenergizing the circuit or equipment shall be warned to stay clear of circuits and equipment.

(iii) Each lock and tag shall be removed by the employee who applied it or under his or her direct supervision. However, if this employee is absent from the work place, then the lock or tag may be removed by a qualified person designated to perform this task provided that:

(A) The employer ensures that the employee who applied the lock or tag is not available at the work place; and

(B) The employer ensures that the employee is aware that the lock or tag has been removed before he or she resumes work at that work place.

(iv) There shall be a visual determination that all employees are clear of the circuits and equipment.

[Statutory Authority: Chapter 49.17 RCW. 96-17-056, § 296-155-429, filed 8/20/96, effective 10/15/96; 94-15-096 (Order 94-07), § 296-155-429, filed 7/20/94, effective 9/20/94; 88-11-021 (Order 88-04), § 296-155-429, filed 5/11/88.]

WAC 296-155-432 Maintenance of equipment. The employer shall ensure that all wiring components and utilization equipment in hazardous locations are maintained in a dust-tight, dust-ignition-proof, or explosion-proof condition, as appropriate. There shall be no loose or missing screws, gaskets, threaded connections, seals, or other impairments to a tight condition.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-432, filed 5/11/88.]

[Title 296 WAC—p. 2206]

WAC 296-155-434 Environmental deterioration of equipment. (1) Deteriorating agents.

(a) Unless identified for use in the operating environment, no conductors or equipment shall be located:

(i) In damp or wet locations;

(ii) Where exposed to gases, fumes, vapors, liquids, or other agents having a deteriorating effect on the conductors or equipment; or

(iii) Where exposed to excessive temperatures.

(b) Control equipment, utilization equipment, and busways approved for use in dry locations only shall be protected against damage from the weather during building construction.

(2) Protection against corrosion. Metal raceways, cable armor, boxes, cable sheathing, cabinets, elbows, couplings, fittings, supports, and support hardware shall be of materials appropriate for the environment in which they are to be installed.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-434, filed 5/11/88.]

WAC 296-155-437 Batteries and battery charging.

(1) General requirements.

(a) Batteries of the unsealed type shall be located in enclosures with outside vents or in well ventilated rooms and shall be arranged so as to prevent the escape of fumes, gases, or electrolyte spray into other areas.

(b) Ventilation shall be provided to ensure diffusion of the gases from the battery and to prevent the accumulation of an explosive mixture.

(c) Racks and trays shall be substantial and shall be treated to make them resistant to the electrolyte.

(d) Floors shall be of acid resistant construction unless protected from acid accumulations.

(e) Face shields, aprons, and rubber gloves shall be provided for and worn by workers handling acids or batteries.

(f) Facilities for quick drenching of the eyes and body shall be provided within 25 feet (7.62 m) of battery handling areas.

(g) Facilities shall be provided for flushing and neutralizing spilled electrolyte and for fire protection.

(2) Charging.

(a) Battery charging installations shall be located in areas designated for that purpose.

(b) Charging apparatus shall be protected from damage by trucks.

(c) When batteries are being charged, the vent caps shall be kept in place to avoid electrolyte spray. Vent caps shall be maintained in functioning condition.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-437, filed 5/11/88.]

WAC 296-155-441 Applicability. (1) Covered. WAC 296-155-441 through 296-155-459 contain installation safety requirements for electrical equipment and installations used to provide electric power and light at the jobsite. These sections apply to installations, both temporary and permanent, used on the jobsite; but these sections do not apply to existing permanent installations that were in place before the construction activity commenced.

Note: If the electrical installation is made in accordance with the National Electrical Code ANSI/NFPA 70-1984, exclusive of formal interpretations and tentative interim amendments, it will be deemed to be in compliance with WAC 296-155-444 through 296-155-459, except for WAC 296-155-447 (2)(a) and 296-155-449 (1)(b)(ii)(E), (F), (G), and (J).

(2) Not covered. WAC 296-155-441 through 296-155-459 do not cover installations used for the generation, transmission, and distribution of electric energy, including related communication, metering, control, and transformation installations. (However, these regulations do cover portable and vehicle-mounted generators used to provide power for equipment used at the jobsite.) See chapter 296-44 WAC, Safety standards—Electrical Construction Code, for the construction of power distribution and transmission lines.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-441, filed 5/11/88.]

WAC 296-155-444 General requirements. (1) Approval. All electrical conductors and equipment shall be approved.

(2) Examination, installation, and use of equipment.

(a) Examination. The employer shall ensure that electrical equipment is free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined on the basis of the following considerations:

(i) Suitability for installation and use in conformity with the provisions of this part. Suitability of equipment for an identified purpose may be evidenced by listing, labeling, or certification for that identified purpose.

(ii) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided.

(iii) Electrical insulation.

(iv) Heating effects under conditions of use.

(v) Arcing effects.

(vi) Classification by type, size, voltage, current capacity, specific use.

(vii) Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with the equipment.

(b) Installation and use. Listed, labeled, or certified equipment shall be installed and used in accordance with instructions included in the listing, labeling, or certification.

(3) Interrupting rating. Equipment intended to break current shall have an interrupting rating at system voltage sufficient for the current that must be interrupted.

(4) Mounting and cooling of equipment.

(a) Mounting. Electric equipment shall be firmly secured to the surface on which it is mounted. Wooden plugs driven into holes in masonry, concrete, plaster, or similar materials shall not be used.

(b) Cooling. Electrical equipment which depends upon the natural circulation of air and convection principles for cooling of exposed surfaces shall be installed so that room air flow over such surfaces is not prevented by walls or by adjacent installed equipment. For equipment designed for floor mounting, clearance between top surfaces and adjacent surfaces shall be provided to dissipate rising warm air. Electrical equipment provided with ventilating openings shall be

installed so that walls or other obstructions do not prevent the free circulation of air through the equipment.

(5) Splices. Conductors shall be spliced or joined with splicing devices designed for the use or by brazing, welding, or soldering with a fusible metal or alloy. Soldered splices shall first be so spliced or joined as to be mechanically and electrically secure without solder and then soldered. All splices and joints and the free ends of conductors shall be covered with an insulation equivalent to that of the conductors or with an insulating device designed for the purpose.

(6) Arcing parts. Parts of electric equipment which in ordinary operation produce arcs, sparks, flames, or molten metal shall be enclosed or separated and isolated from all combustible material.

(7) Marking. Electrical equipment shall not be used unless the manufacturer's name, trademark, or other descriptive marking by which the organization responsible for the product may be identified is placed on the equipment and unless other markings are provided giving voltage, current, wattage, or other ratings as necessary. The marking shall be of sufficient durability to withstand the environment involved.

(8) Identification of disconnecting means and circuits. Each disconnecting means required by this part for motors and appliances shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

(9) Construction site. Precautions shall be taken to make any necessary open wiring inaccessible to unauthorized personnel.

(10) 600 volts, nominal, or less. This subsection applies to equipment operating at 600 volts, nominal, or less.

(a) Working space about electric equipment. Sufficient access and working space shall be provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment.

(i) Working clearances. Except as required or permitted elsewhere in this part, the dimension of the working space in the direction of access to live parts operating at 600 volts or less and likely to require examination, adjustment, servicing, or maintenance while alive shall not be less than indicated in Table I-1. In addition to the dimensions shown in Table I-1, workspace shall not be less than 30 inches (762 mm) wide in front of the electric equipment. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. Walls constructed of concrete, brick, or tile are considered to be grounded. Working space is not required in back of assemblies such as dead-front switchboards or motor control centers where there are no renewable or adjustable parts such as fuses or switches on the back and where all connections are accessible from locations other than the back.

Table I-1
Working Clearances

Nominal Voltage to Ground	Minimum Clear Distance for Conditions ¹		
	(a)	(b)	(c)
	Feet ²	Feet ²	Feet ²
0-150	3	3	3
151-600	3	3 1/2	4

¹ Conditions (a), (b), and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating material. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. (c) Exposed live parts on both sides of the workspace not guarded provided in condition (a) with the operator between.

² Note: For International System of Units (SI): One foot=0.3048m.

(ii) Clear spaces. Working space required by this part shall not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, shall be guarded.

(iii) Access and entrance to working space. At least one entrance shall be provided to give access to the working space about electric equipment.

(iv) Front working space. Where there are live parts normally exposed on the front of switchboards or motor control centers, the working space in front of such equipment shall not be less than 3 feet (914 mm).

(v) Headroom. The minimum headroom of working spaces about service equipment, switchboards, panelboards, or motor control centers shall be 6 feet 3 inches (1.91 m).

(b) Guarding of live parts.

(i) Except as required or permitted elsewhere in this part, live parts of electric equipment operating at 50 volts or more shall be guarded against accidental contact by cabinets or other forms of enclosures, or by any of the following means:

(A) By location in a room, vault, or similar enclosure that is accessible only to qualified persons.

(B) By partitions or screens so arranged that only qualified persons will have access to the space within reach of the live parts. Any openings in such partitions or screens shall be so sized and located that persons are not likely to come into accidental contact with the live parts or to bring conducting objects into contact with them.

(C) By location on a balcony, gallery, or platform so elevated and arranged as to exclude unqualified persons.

(D) By elevation of 8 feet (2.44 m) or more above the floor or other working surface and so installed as to exclude unqualified persons.

(ii) In locations where electric equipment would be exposed to physical damage, enclosures or guards shall be so arranged and of such strength as to prevent such damage.

(iii) Entrances to rooms and other guarded locations containing exposed live parts shall be marked with conspicuous warning signs forbidding unqualified persons to enter.

(11) Over 600 volts, nominal.

(a) General. Conductors and equipment used on circuits exceeding 600 volts, nominal, shall comply with all applicable provisions of subsections (1) through (7) of this section and with the following provisions which supplement or mod-

ify those requirements. The provisions of (b), (c), and (d) of this subsection do not apply to equipment on the supply side of the service conductors.

(b) Enclosure for electrical installations. Electrical installations in a vault, room, closet or in an area surrounded by a wall, screen, or fence, access to which is controlled by lock and key or other equivalent means, are considered to be accessible to qualified persons only. A wall, screen, or fence less than 8 feet (2.44 m) in height is not considered adequate to prevent access unless it has other features that provide a degree of isolation equivalent to an 8 foot (2.44 m) fence. The entrances to all buildings, rooms or enclosures containing exposed live parts or exposed conductors operating at over 600 volts, nominal, shall be kept locked or shall be under the observation of a qualified person at all times.

(i) Installations accessible to qualified persons only. Electrical installations having exposed live parts shall be accessible to qualified persons only and shall comply with the applicable provisions of (c) of this subsection.

(ii) Installations accessible to unqualified persons. Electrical installations that are open to unqualified persons shall be made with metal-enclosed equipment or shall be enclosed in a vault or in an area, access to which is controlled by a lock. Metal-enclosed switchgear, unit substations, transformers, pull boxes, connection boxes, and other similar associated equipment shall be marked with appropriate caution signs. If equipment is exposed to physical damage from vehicular traffic, guards shall be provided to prevent such damage. Ventilating or similar openings in metal-enclosed equipment shall be designed so that foreign objects inserted through these openings will be deflected from energized parts.

(c) Workspace about equipment. Sufficient space shall be provided and maintained about electric equipment to permit ready and safe operation and maintenance of such equipment. Where energized parts are exposed, the minimum clear workspace shall not be less than 6 feet 6 inches (1.98 m) high (measured vertically from the floor or platform,) or less than 3 feet (914 mm) wide (measured parallel to the equipment.) The depth shall be as required in Table I-2. The workspace shall be adequate to permit at least a ninety degree opening of doors or hinged panels.

(i) Working space. The minimum clear working space in front of electric equipment such as switchboards, control panels, switches, circuit breakers, motor controllers, relays, and similar equipment shall not be less than specified in Table I-2 unless otherwise specified in this part. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. However, working space is not required in back of equipment such as deadfront switchboards or control assemblies where there are no renewable or adjustable parts (such as fuses or switches) on the back and where all connections are accessible from locations other than the back. Where rear access is required to work on de-energized parts on the back of enclosed equipment, a minimum working space of 30 inches (762 mm) horizontally shall be provided.

Table I-2
Minimum Depth of Clear Working
Space in Front of electric Equipment

Nominal Voltage to Ground	Minimum Clear Distance for Conditions ¹		
	(a)	(b)	(c)
	Feet ²	Feet ²	Feet ²
601 to 2,500	3	4	5
2,501 to 9,000	4	5	6
9,001 to 25,000	5	6	9
25,001 to 75kV	6	8	10
Above 75kV	8	10	12

¹ Conditions (a), (b), and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating materials. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. Walls constructed of concrete, brick, or the tile are considered to be grounded surfaces. (c) Exposed live parts on both sides of the workspace (not guarded as provided in Condition (a)) with the operator between.

² Note: For S1 units: One foot = 0.3048m.

(ii) Lighting outlets and points of control. The lighting outlets shall be so arranged that persons changing lamps or making repairs on the lighting system will not be endangered by live parts or other equipment. The points of control shall be so located that persons are not likely to come in contact with any live part or moving part of the equipment while turning on the lights.

(iii) Elevation of unguarded live parts. Unguarded live parts above working space shall be maintained at elevations not less than specified in Table I-3.

Table I-3
Elevation of Unguarded
Energized Parts Above Working Space

Nominal Voltage to Between Phases	Minimum Elevation
601 to 7,500	8 feet 6 inches ¹
7,501 to 35,000	9 feet
Over 35kV	9 feet + 0.37 inches per kV above 35kV

¹ Note: For S1 units: One inch = 25.4mm, one foot = 0.3048m.

(d) Entrance and access to workspace. At least one entrance not less than 24 inches (610 mm) wide and 6 feet 6 inches (1.98 m) high shall be provided to give access to the working space about electric equipment. On switchboard and control panels exceeding 48 inches (1.22 m) in width, there shall be one entrance at each end of such board where practicable. Where bare energized parts at any voltage or insulated energized parts above 600 volts are located adjacent to such entrance, they shall be guarded.

(12) Welding and cutting equipment. Welding and cutting equipment shall meet the requirements specified in Parts D and H of this chapter.

[Statutory Authority: Chapter 49.17 RCW. 93-19-142 (Order 93-04), § 296-155-444, filed 9/22/93, effective 11/1/93; 92-23-017 (Order 92-13), § 296-155-444, filed 11/10/92, effective 12/18/92; 88-11-021 (Order 88-04), § 296-155-444, filed 5/11/88.]

WAC 296-155-447 Wiring design and protection. (1)

Use and identification of grounded and grounding conductors.

(a) Identification of conductors. A conductor used as a grounded conductor shall be identifiable and distinguishable from all other conductors. A conductor used as an equipment grounding conductor shall be identifiable and distinguishable from all other conductors.

(b) Polarity of connections. No grounded conductor shall be attached to any terminal or lead so as to reverse designated polarity.

(c) Use of grounding terminals and devices. A grounding terminal or grounding-type device on a receptacle, cord connector, or attachment plug shall not be used for purposes other than grounding.

(2) Branch circuits.

(a) Ground-fault protection.

(i) General. The employer shall use either ground-fault circuit interrupters as specified in (a)(ii) of this subsection or an assured equipment grounding conductor program as specified in (a)(iii) of this subsection to protect employees on construction sites. These requirements are in addition to any other requirements for equipment grounding conductors.

(ii) Ground-fault circuit interrupters. All 120-volt, single-phase, 15-ampere and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, shall have approved ground-fault circuit interrupters for personnel protection. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5kW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground-fault circuit interrupters.

(iii) Assured equipment grounding conductor program. The employer shall establish and implement an assured equipment grounding conductor program on construction sites covering all cord sets, receptacles which are not a part of the building or structure, and equipment connected by cord and plug which are available for use or used by employees. This program shall comply with the following minimum requirements:

(A) A written description of the program, including the specific procedures adopted by the employer, shall be available at the jobsite for inspection and copying by the director and any affected employee.

(B) The employer shall designate one or more competent persons (as defined in WAC 296-155-012(4)) to implement the program, and to perform continuing tests and inspections as required.

(C) Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day's use for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective shall not be used until repaired.

(D) The following tests shall be performed on all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and cord-connected and plug-connected equipment required to be grounded:

(I) All equipment grounding conductors shall be tested for continuity and shall be electrically continuous.

(II) Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.

(III) Each outlet receptacle, or power source shall be tested to ensure proper polarity.

(E) All required tests shall be performed:

(I) Before first use;

(II) Before equipment is returned to service following any repairs;

(III) Before equipment is used after any incident which can be reasonably suspected to have caused damage (for example, when a cord set is run over); and

(IV) At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months.

(F) The employer shall not make available or permit the use by employees of any equipment which has not met the requirements of (a)(iii) of this subsection.

(G) Tests performed as required in this subsection shall be recorded. This test record shall identify each receptacle, cord set, and cord-connected and plug-connected equipment that passed the test and shall indicate the last date it was tested or the interval for which it was tested. This record shall be kept by means of logs, color coding, or other effective means and shall be maintained until replaced by a more current record. The record shall be made available on the jobsite for inspection by the director and any affected employee.

(b) Outlet devices. Outlet devices shall have an ampere rating not less than the load to be served and shall comply with the following:

(i) Single receptacles. A single receptacle installed on an individual branch circuit shall have an ampere rating of not less than that of the branch circuit.

(ii) Two or more receptacles. Where connected to a branch circuit supplying two or more receptacles or outlets, receptacle ratings shall conform to the values listed in Table I-4.

(iii) Receptacles used for the connection of motors. The rating of an attachment plug or receptacle used for cord-connection and plug-connection of a motor to a branch circuit shall not exceed 15 amperes at 125 volts or 10 amperes at 250 volts if individual overload protection is omitted.

Table I-4
Receptacle Ratings for Various Size Circuits

Circuit Rating Amperes	Receptacle Rating Amperes
15	Not Over 15
20	15 or 20
30	30
40	40 or 50
50	50

(3) Outside conductors and lamps.

(a) 600 volts, nominal, or less. (a)(i) through (iv)(D) of this subsection apply to branch circuit, feeder, and service

conductors rated 600 volts, nominal, or less and run outdoors as open conductors.

(i) Conductors on poles. Conductors supported on poles shall provide a horizontal climbing space not less than the following:

(A) Power conductors below communication conductors: 30 inches (762 mm).

(B) Power conductors alone or above communication conductors: 300 volts or less—24 inches (610 mm); more than 300 volts—30 inches (762 mm).

(C) Communication conductors below power conductors: With power conductors 300 volts or less—24 inches (610 mm); more than 300 volts—30 inches (762 mm).

(ii) Clearance from ground. Open conductors shall conform to the following minimum clearances:

(A) 10 feet (3.05 m)—above finished grade, sidewalks, or from any platform or projection from which they might be reached.

(B) 12 feet (3.66 m)—over areas subject to vehicular traffic other than truck traffic.

(C) 15 feet (4.57 m)—over areas other than those specified in (a)(ii)(D) of this subsection that are subject to truck traffic.

(D) 18 feet (5.49 m)—over public streets, alleys, roads, and driveways.

(iii) Clearance from building openings. Conductors shall have a clearance of at least 3 feet (914 mm) from windows, doors, fire escapes, or similar locations. Conductors run above the top level of a window are considered to be out of reach from that window and, therefore, do not have to be 3 feet (914 mm) away.

(iv) Clearance over roofs. Conductors above roof space accessible to employees on foot shall have a clearance from the highest point of the roof surface of not less than 8 feet (2.44 m) vertical clearance for insulated conductors, not less than 10 feet (3.05 m) vertical or diagonal clearance for covered conductors, and not less than 15 feet (4.57 m) for bare conductors, except that:

(A) Where the roof space is also accessible to vehicular traffic, the vertical clearance shall not be less than 18 feet (5.49 m); or

(B) Where the roof space is not normally accessible to employees on foot, fully insulated conductors shall have a vertical or diagonal clearance of not less than 3 feet (914 mm); or

(C) Where the voltage between conductors is 300 volts or less and the roof has a slope of not less than 4 inches (102 mm) in 12 inches (305 mm), the clearance from roofs shall be at least 3 feet (914 mm); or

(D) Where the voltage between conductors is 300 volts or less and the conductors do not pass over more than 4 feet (1.22 m) of the overhang portion of the roof and they are terminated at a through-the-roof raceway or support, the clearance from roofs shall be at least 18 inches (457 mm).

(b) Location of outdoor lamps. Lamps for outdoor lighting shall be located below all live conductors, transformers, or other electric equipment, unless such equipment is controlled by a disconnecting means that can be locked in the open position or unless adequate clearances or other safeguards are provided for relamping operations.

(4) Services.

(a) Disconnecting means.

(i) General. Means shall be provided to disconnect all conductors in a building or other structure from the service-entrance conductors. The disconnecting means shall plainly indicate whether it is in the open or closed position and shall be installed at a readily accessible location nearest the point of entrance of the service-entrance conductors.

(ii) Simultaneous opening of poles. Each service disconnecting means shall simultaneously disconnect all ungrounded conductors.

(b) Services over 600 volts, nominal. The following additional requirements apply to services over 600 volts, nominal.

(i) Guarding. Service-entrance conductors installed as open wires shall be guarded to make them accessible only to qualified persons.

(ii) Warning signs. Signs warning of high voltage shall be posted where unauthorized employees might come in contact with live parts.

(5) Overcurrent protection.

(a) 600 volts, nominal, or less. The following requirements apply to overcurrent protection of circuits rated 600 volts, nominal, or less.

(i) Protection of conductors and equipment. Conductors and equipment shall be protected from overcurrent in accordance with their ability to safely conduct current. Conductors shall have sufficient ampacity to carry the load.

(ii) Grounded conductors. Except for motor-running overload protection, overcurrent devices shall not interrupt the continuity of the grounded conductor unless all conductors of the circuit are opened simultaneously.

(iii) Disconnection of fuses and thermal cutouts. Except for devices provided for current-limiting on the supply side of the service disconnecting means, all cartridge fuses which are accessible to other than qualified persons and all fuses and thermal cutouts on circuits over 150 volts to ground shall be provided with disconnecting means. This disconnecting means shall be installed so that the fuse or thermal cutout can be disconnected from its supply without disrupting service to equipment and circuits unrelated to those protected by the overcurrent device.

(iv) Location in or on premises. Overcurrent devices shall be readily accessible. Overcurrent devices shall not be located where they could create an employee safety hazard by being exposed to physical damage or located in the vicinity of easily ignitable material.

(v) Arcing or suddenly moving parts. Fuses and circuit breakers shall be so located or shielded that employees will not be burned or otherwise injured by their operation.

(vi) Circuit breakers.

(A) Circuit breakers shall clearly indicate whether they are in the open (off) or closed (on) position.

(B) Where circuit breaker handles on switchboards are operated vertically rather than horizontally or rotationally, the up position of the handle shall be the closed (on) position.

(C) If used as switches in 120-volt, fluorescent lighting circuits, circuit breakers shall be marked "SWD."

(b) Over 600 volts, nominal. Feeders and branch circuits over 600 volts, nominal, shall have short-circuit protection.

(6) Effective grounding. The path from circuits, equipment, structures, and conduit or enclosures to ground shall be permanent and continuous; have ample carrying capacity to conduct safely the currents liable to be imposed on it; and have the impedance sufficiently low to limit the potential above ground and to result in the operation of the overcurrent devices in the circuit. (a) through (k) of this subsection contain grounding requirements for systems, circuits, and equipment.

(a) Systems to be grounded. The following systems which supply premises wiring shall be grounded:

(i) Three-wire DC systems. All three-wire DC systems shall have their neutral conductor grounded.

(ii) Two-wire DC systems. Two-wire DC systems operating at over 50 volts through 300 volts between conductors shall be grounded unless they are rectifier-derived from an AC system complying with (a)(iii), (iv), and (v) of this subsection.

(iii) AC circuits, less than 50 volts. AC circuits of less than 50 volts shall be grounded if they are installed as overhead conductors outside of buildings or if they are supplied by transformers and the transformer primary supply system is ungrounded or exceeds 150 volts to ground.

(iv) AC systems, 50 volts to 1000 volts. AC systems of 50 volts to 1000 volts shall be grounded under any of the following conditions, unless exempted by (a)(v) of this subsection:

(A) If the system can be so grounded that the maximum voltage to ground on the ungrounded conductors does not exceed 150 volts;

(B) If the system is nominally rated 480Y/277 volt, 3-phase, 4-wire in which the neutral is used as a circuit conductor;

(C) If the system is nominally rated 240/120 volt, 3-phase, 4-wire in which the midpoint of one phase is used as a circuit conductor; or

(D) If a service conductor is uninsulated.

(v) Exceptions. AC systems of 50 volts to 1000 volts are not required to be grounded if the system is separately derived and is supplied by a transformer that has a primary voltage rating less than 1000 volts, provided all of the following conditions are met:

(A) The system is used exclusively for control circuits;

(B) The conditions of maintenance and supervision assure that only qualified persons will service the installation;

(C) Continuity of control power is required; and

(D) Ground detectors are installed on the control system.

(b) Separately derived systems. Where (a) of this subsection requires grounding of wiring systems whose power is derived from generator, transformer, or converter windings and has no direct electrical connection, including a solidly connected grounded circuit conductor, to supply conductors originating in another system, (e) of this subsection shall also apply.

(c) Portable and vehicle-mounted generators.

(i) Portable generators. Under the following conditions, the frame of a portable generator need not be grounded and may serve as the grounding electrode for a system supplied by the generator:

(A) The generator supplies only equipment mounted on the generator and/or cord-connected and plug-connected equipment through receptacles mounted on the generator; and

(B) The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame.

(ii) Vehicle-mounted generators. Under the following conditions the frame of a vehicle may serve as the grounding electrode for a system supplied by a generator located on the vehicle:

(A) The frame of the generator is bonded to the vehicle frame; and

(B) The generator supplies only equipment located on the vehicle and/or cord-connected and plug-connected equipment through receptacles mounted on the vehicle or on the generator; and

(C) The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame; and

(D) The system complies with all other provisions of this section.

(iii) Neutral conductor bonding. A neutral conductor shall be bonded to the generator frame if the generator is a component of a separately derived system. No other conductor need be bonded to the generator frame.

(d) Conductors to be grounded. For AC premises wiring systems the identified conductor shall be grounded.

(e) Grounding connections.

(i) Grounded system. For a grounded system, a grounding electrode conductor shall be used to connect both the equipment grounding conductor and the grounded circuit conductor to the grounding electrode. Both the equipment grounding conductor and the grounding electrode conductor shall be connected to the grounded circuit conductor on the supply side of the service disconnecting means, or on the supply side of the system disconnecting means or overcurrent devices if the system is separately derived.

(ii) Ungrounded systems. For an ungrounded service-supplied system, the equipment grounding conductor shall be connected to the grounding electrode conductor at the service equipment. For an ungrounded separately derived system, the equipment grounding conductor shall be connected to the grounding electrode conductor at, or ahead of, the system disconnecting means or overcurrent devices.

(f) Grounding path. The path to ground from circuits, equipment, and enclosures shall be permanent and continuous.

(g) Supports, enclosures, and equipment to be grounded.

(i) Supports and enclosures for conductors. Metal cable trays, metal raceways, and metal enclosures for conductors shall be grounded, except that:

(A) Metal enclosures such as sleeves that are used to protect cable assemblies from physical damage need not be grounded; and

(B) Metal enclosures for conductors added to existing installations of open wire, knob-and-tube wiring, and nonmetallic-sheathed cable need not be grounded if all of the following conditions are met:

(I) Runs are less than 25 feet (7.62 m);

(II) Enclosures are free from probable contact with ground, grounded metal, metal laths, or other conductive materials; and

(III) Enclosures are guarded against employee contact.

(ii) Service equipment enclosures. Metal enclosures for service equipment shall be grounded.

(iii) Fixed equipment. Exposed noncurrent-carrying metal parts of fixed equipment which may become energized shall be grounded under any of the following conditions:

(A) If within 8 feet (2.44 m) vertically or 5 feet (1.52 m) horizontally of ground or grounded metal objects and subject to employee contact.

(B) If located in a wet or damp location and subject to employee contact.

(C) If in electrical contact with metal.

(D) If in a hazardous (classified) location.

(E) If supplied by a metal-clad, metal-sheathed, or grounded metal raceway wiring method.

(F) If equipment operates with any terminal at over 150 volts to ground; however, the following need not be grounded:

(I) Enclosures for switches or circuit breakers used for other than service equipment and accessible to qualified persons only;

(II) Metal frames of electrically heated appliances which are permanently and effectively insulated from ground; and

(III) The cases of distribution apparatus such as transformers and capacitors mounted on wooden poles at a height exceeding 8 feet (2.44 m) above ground or grade level.

(iv) Equipment connected by cord and plug. Under any of the conditions described in (g)(iv)(A) through (C) of this subsection, exposed noncurrent-carrying metal parts of cord-connected and plug-connected equipment which may become energized shall be grounded:

(A) If in a hazardous (classified) location (see WAC 296-155-444).

(B) If operated at over 150 volts to ground, except for guarded motors and metal frames of electrically heated appliances if the appliance frames are permanently and effectively insulated from ground.

(C) If the equipment is one of the types listed in (g)(iv)(C)(I) through (V) of this subsection. However, even though the equipment may be one of these types, it need not be grounded if it is exempted by (g)(iv)(C)(VI) of this subsection.

(I) Hand held motor-operated tools;

(II) Cord-connected and plug-connected equipment used in damp or wet locations or by employees standing on the ground or on metal floors or working inside of metal tanks or boilers;

(III) Portable and mobile x-ray and associated equipment;

(IV) Tools likely to be used in wet and/or conductive locations; and

(V) Portable hand lamps.

(VI) Tools likely to be used in wet and/or conductive locations need not be grounded if supplied through an isolating transformer with an ungrounded secondary of not over 50 volts. Listed or labeled portable tools and appliances protected by a system of double insulation, or its equivalent,

need not be grounded. If such a system is employed, the equipment shall be distinctively marked to indicate that the tool or appliance utilizes a system of double insulation.

(v) Nonelectrical equipment. The metal parts of the following nonelectrical equipment shall be grounded: Frames and tracks of electrically operated cranes; frames of nonelectrically driven elevator cars to which electric conductors are attached; hand-operated metal shifting ropes or cables of electric elevators, and metal partitions, grill work, and similar metal enclosures around equipment of over 1kV between conductors.

(h) Methods of grounding equipment.

(i) With circuit conductors. Noncurrent-carrying metal parts of fixed equipment, if required to be grounded by this part, shall be grounded by an equipment grounding conductor which is contained within the same raceway, cable, or cord, or runs with or encloses the circuit conductors. For DC circuits only, the equipment grounding conductor may be run separately from the circuit conductors.

(ii) Grounding conductor. A conductor used for grounding fixed or movable equipment shall have capacity to conduct safely any fault current which may be imposed on it.

(iii) Equipment considered effectively grounded. Electric equipment is considered to be effectively grounded if it is secured to, and in electrical contact with, a metal rack or structure that is provided for its support and the metal rack or structure is grounded by the method specified for the noncurrent-carrying metal parts of fixed equipment in (h)(i) of this subsection. Metal car frames supported by metal hoisting cables attached to or running over metal sheaves or drums of grounded elevator machines are also considered to be effectively grounded.

(i) Bonding.

(i) If bonding conductors are used to assure electrical continuity, they shall have the capacity to conduct any fault current which may be imposed.

(ii) When attaching bonding and grounding clamps or clips, a secure and positive metal-to-metal contact shall be made. Such attachments shall be made before closures are opened and material movements are started and shall not be broken until after material movements are stopped and closures are made.

(j) Made electrodes. If made electrodes are used, they shall be free from nonconductive coatings, such as paint or enamel; and, if practicable, they shall be embedded below permanent moisture level. A single electrode consisting of a rod, pipe or plate which has a resistance to ground greater than 25 ohms shall be augmented by one additional electrode installed no closer than 6 feet (1.83 m) to the first electrode.

(k) Grounding of systems and circuits of 1000 volts and over (high voltage).

(i) General. If high voltage systems are grounded, they shall comply with all applicable provisions of (a) through (j) of this subsection as supplemented and modified by (k) of this subsection.

(ii) Grounding of systems supplying portable or mobile equipment. Systems supplying portable or mobile high voltage equipment, other than substations installed on a temporary basis, shall comply with the following:

(A) Portable and mobile high voltage equipment shall be supplied from a system having its neutral grounded through an impedance. If a delta-connected high voltage system is used to supply the equipment, a system neutral shall be derived.

(B) Exposed noncurrent-carrying metal parts of portable and mobile equipment shall be connected by an equipment grounding conductor to the point at which the system neutral impedance is grounded.

(C) Ground-fault detection and relaying shall be provided to automatically deenergize any high voltage system component which has developed a ground fault. The continuity of the equipment grounding conductor shall be continuously monitored so as to de-energize automatically the high voltage feeder to the portable equipment upon loss of continuity of the equipment grounding conductor.

(D) The grounding electrode to which the portable or mobile equipment system neutral impedance is connected shall be isolated from and separated in the ground by at least 20 feet (6.1 m) from any other system or equipment grounding electrode, and there shall be no direct connection between the grounding electrodes, such as buried pipe, fence or like objects.

(iii) Grounding of equipment. All noncurrent-carrying metal parts of portable equipment and fixed equipment including their associated fences, housings, enclosures, and supporting structures shall be grounded. However, equipment which is guarded by location and isolated from ground need not be grounded. Additionally, pole-mounted distribution apparatus at a height exceeding 8 feet (2.44 m) above ground or grade level need not be grounded.

[Statutory Authority: Chapter 49.17 RCW. 93-19-142 (Order 93-04), § 296-155-447, filed 9/22/93, effective 11/1/93; 88-11-021 (Order 88-04), § 296-155-447, filed 5/11/88.]

WAC 296-155-449 Wiring methods, components, and equipment for general use. (1) Wiring methods. The provisions of this subsection do not apply to conductors which form an integral part of equipment such as motors, controllers, motor control centers and like equipment.

(a) General requirements.

(i) Electrical continuity of metal raceways and enclosures. Metal raceways, cable armor, and other metal enclosures for conductors shall be metallically joined together into a continuous electric conductor and shall be so connected to all boxes, fittings, and cabinets as to provide effective electrical continuity.

(ii) Wiring in ducts. No wiring systems of any type shall be installed in ducts used to transport dust, loose stock or flammable vapors. No wiring system of any type shall be installed in any duct used for vapor removal or in any shaft containing only such ducts.

(iii) Receptacles for attachment plugs shall be approved, concealed contact type with a contact for extending ground continuity and shall be so designed and constructed that the plug may be pulled out without leaving any live parts exposed to accidental contact. All temporary outlet boxes shall be of a type suitable for use in wet or damp locations.

(iv) Attachment plugs or other connectors supplying equipment at more than 300 volts shall be of the skirted type or otherwise so designed that arcs will be confined.

(b) Temporary wiring.

(i) Scope. The provisions of (b) of this subsection apply to temporary electrical power and lighting wiring methods which may be of a class less than would be required for a permanent installation. Except as specifically modified in (b) of this subsection, all other requirements of this part for permanent wiring shall apply to temporary wiring installations. Temporary wiring shall be removed immediately upon completion of construction or the purpose for which the wiring was installed.

(ii) General requirements for temporary wiring.

(A) Feeders shall originate in a distribution center. The conductors shall be run as multiconductor cord or cable assemblies or within raceways; or, where not subject to physical damage, they may be run as open conductors on insulators not more than 10 feet (3.05 m) apart.

(B) Branch circuits shall originate in a power outlet or panelboard. Conductors shall be run as multiconductor cord or cable assemblies or open conductors, or shall be run in raceways. All conductors shall be protected by overcurrent devices at their ampacity. Runs of open conductors shall be located where the conductors will not be subject to physical damage, and the conductors shall be fastened at intervals not exceeding 10 feet (3.05 m). No branch-circuit conductors shall be laid on the floor. Each branch circuit that supplies receptacles or fixed equipment shall contain a separate equipment grounding conductor if the branch circuit is run as open conductors.

(C) Receptacles shall be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit shall contain a separate equipment grounding conductor, and all receptacles shall be electrically connected to the grounding conductor. Receptacles for uses other than temporary lighting shall not be installed on branch circuits which supply temporary lighting. Receptacles shall not be connected to the same ungrounded conductor of multiwire circuits which supply temporary lighting.

(D) Disconnecting switches or plug connectors shall be installed to permit the disconnection of all ungrounded conductors of each temporary circuit.

(E) All lamps for general illumination shall be protected from accidental contact or breakage. Metal-case sockets shall be grounded.

(F) Temporary lights shall be equipped with hard usage (S or SJ types) electric cords with connections and insulation maintained in safe condition. "Brewery" cord (type CBO or NB) may be substituted for hard usage cord provided it is protected from physical damages. Temporary lights shall not be suspended by their electric cords unless cords and lights are designed for this means of suspension. Splices shall retain the insulation, outer sheath properties, flexibility, and usage characteristics of the cord being spliced.

When pin-type connectors or lampholders are utilized, the area of perforations caused by lampholder removal shall be restored to the insulation capabilities of the cord.

(G) Portable electric lighting used in wet and/or other conductive locations, as for example, drums, tanks, and vessels, shall be operated at 12 volts or less. However, 120-volt lights may be used if protected by a ground-fault circuit interrupter.

(H) A box shall be used wherever a change is made to a raceway system or a cable system which is metal clad or metal sheathed.

(I) Flexible cords and cables shall be protected from damage. Sharp corners and projections shall be avoided. Flexible cords and cables may pass through doorways or other pinch points, if protection is provided to avoid damage.

(J) Extension cord sets used with portable electric tools and appliances shall be of three-wire type and shall be designed for hard or extra-hard usage. Flexible cords used with temporary and portable lights shall be designed for hard or extra-hard usage.

Note: The National Electrical Code, ANSI/NFPA 70, in Article 400, Table 400-4, lists various types of flexible cords, some of which are noted as being designed for hard or extra-hard usage. Examples of these types of flexible cords include hard service cord (types S, ST, SO, STO) and junior hard service cord (types SJ, SJO, SJT, SJTO).

(iii) Guarding. For temporary wiring over 600 volts, nominal, fencing, barriers, or other effective means shall be provided to prevent access of other than authorized and qualified personnel.

(2) Cabinets, boxes, and fittings.

(a) Conductors entering boxes, cabinets, or fittings. Conductors entering boxes, cabinets, or fittings shall be protected from abrasion, and openings through which conductors enter shall be effectively closed. Unused openings in cabinets, boxes, and fittings shall also be effectively closed.

(b) Covers and canopies. All pull boxes, junction boxes, and fittings shall be provided with covers. If metal covers are used, they shall be grounded. In energized installations each outlet box shall have a cover, faceplate, or fixture canopy. Covers of outlet boxes having holes through which flexible cord pendants pass shall be provided with bushings designed for the purpose or shall have smooth, well-rounded surfaces on which the cords may bear.

(c) Pull and junction boxes for systems over 600 volts, nominal. In addition to other requirements in this section for pull and junction boxes, the following shall apply to these boxes for systems over 600 volts, nominal:

(i) Complete enclosure. Boxes shall provide a complete enclosure for the contained conductors or cables.

(ii) Covers. Boxes shall be closed by covers securely fastened in place. Underground box covers that weigh over 100 pounds (43.6 kg) meet this requirement. Covers for boxes shall be permanently marked "HIGH VOLTAGE." The marking shall be on the outside of the box cover and shall be readily visible and legible.

(3) Knife switches. Single-throw knife switches shall be so connected that the blades are dead when the switch is in the open position. Single-throw knife switches shall be so placed that gravity will not tend to close them. Single-throw knife switches approved for use in the inverted position shall be provided with a locking device that will ensure that the blades remain in the open position when so set. Double-throw knife switches may be mounted so that the throw will be either vertical or horizontal. However, if the throw is vertical, a locking device shall be provided to ensure that the blades remain in the open position when so set.

(4) Switchboards and panelboards. Switchboards that have any exposed live parts shall be located in permanently dry locations and accessible only to qualified persons. Panelboards shall be mounted in cabinets, cutout boxes, or enclosures designed for the purpose and shall be dead front. However, panelboards other than the dead front externally-operable type are permitted where accessible only to qualified persons. Exposed blades of knife switches shall be dead when open.

(5) Enclosures for damp or wet locations.

(a) Cabinets, fittings, and boxes. Cabinets, cutout boxes, fittings, boxes, and panelboard enclosures in damp or wet locations shall be installed so as to prevent moisture or water from entering and accumulating within the enclosures. In wet locations the enclosures shall be weatherproof.

(b) Switches and circuit breakers. Switches, circuit breakers, and switchboards installed in wet locations shall be enclosed in weatherproof enclosures.

(6) Conductors for general wiring. All conductors used for general wiring shall be insulated unless otherwise permitted in this part. The conductor insulation shall be of a type that is suitable for the voltage, operating temperature, and location of use. Insulated conductors shall be distinguishable by appropriate color or other means as being grounded conductors, ungrounded conductors, or equipment grounding conductors.

(7) Flexible cords and cables.

(a) Use of flexible cords and cables.

(i) Permitted uses. Flexible cords and cables shall be suitable for conditions of use and location. Flexible cords and cables shall be used only for:

(A) Pendants;

(B) Wiring of fixtures;

(C) Connection of portable lamps or appliances;

(D) Elevator cables;

(E) Wiring of cranes and hoists;

(F) Connection of stationary equipment to facilitate their frequent interchange;

(G) Prevention of the transmission of noise or vibration; or

(H) Appliances where the fastening means and mechanical connections are designed to permit removal for maintenance and repair.

(ii) Attachment plugs for cords. If used as permitted in (a)(i)(C), (F), or (H) of this subsection, the flexible cord shall be equipped with an attachment plug and shall be energized from a receptacle outlet.

(iii) Prohibited uses. Unless necessary for a use permitted in (a)(i) of this subsection, flexible cords and cables shall not be used:

(A) As a substitute for the fixed wiring of a structure;

(B) Where run through holes in walls, ceilings, or floors;

(C) Where run through doorways, windows, or similar openings, except as permitted in subsection (1)(b)(ii)(I) of this section;

(D) Where attached to building surfaces; or

(E) Where concealed behind building walls, ceilings, or floors.

(b) Identification, splices, and terminations.

(i) Identification. A conductor of a flexible cord or cable that is used as a grounded conductor or an equipment grounding conductor shall be distinguishable from other conductors.

(ii) Marking. Type SJ, SJO, SJT, SJTO, S, SO, ST, and STO cords shall not be used unless durably marked on the surface with the type designation, size, and number of conductors.

(iii) Splices. Flexible cords shall be used only in continuous lengths without splice or tap. Hard service flexible cords No. 12 or larger may be repaired if spliced so that the splice retains the insulation, outer sheath properties, and usage characteristics of the cord being spliced.

(iv) Strain relief. Flexible cords shall be connected to devices and fittings so that strain relief is provided which will prevent pull from being directly transmitted to joints or terminal screws.

(v) Cords passing through holes. Flexible cords and cables shall be protected by bushings or fittings where passing through holes in covers, outlet boxes, or similar enclosures.

(vi) Trailing cables shall be protected from damage.

(vii) Cord and cable passing through work areas shall be covered or elevated to protect it from damage which would create a hazard to employees.

(8) Portable cables over 600 volts, nominal. Multiconductor portable cable for use in supplying power to portable or mobile equipment at over 600 volts, nominal, shall consist of No. 8 or larger conductors employing flexible stranding. Cables operated at over 2000 volts shall be shielded for the purpose of confining the voltage stresses to the insulation. Grounding conductors shall be provided. Connectors for these cables shall be of a locking type with provisions to prevent their opening or closing while energized. Strain relief shall be provided at connections and terminations. Portable cables shall not be operated with splices unless the splices are of the permanent molded, vulcanized, or other equivalent type. Termination enclosures shall be marked with a high voltage hazard warning, and terminations shall be accessible only to authorized and qualified personnel.

(9) Fixture wires.

(a) General. Fixture wires shall be suitable for the voltage, temperature, and location of use. A fixture wire which is used as a grounded conductor shall be identified.

(b) Uses permitted. Fixture wires may be used:

(i) For installation in lighting, fixtures and in similar equipment where enclosed or protected and not subject to bending or twisting in use; or

(ii) For connecting lighting fixtures to the branch-circuit conductors supplying the fixtures.

(c) Uses not permitted. Fixture wires shall not be used as branch-circuit conductors except as permitted for Class 1 power-limited circuits.

(10) Equipment for general use.

(a) Lighting fixtures, lampholders, lamps, and receptacles.

(i) Live parts. Fixtures, lampholders, lamps, rosettes, and receptacles shall have no live parts normally exposed to employee contact. However, rosettes and cleat-type lampholders and receptacles located at least 8 feet (2.44 m) above the floor may have exposed parts.

(ii) Support. Fixtures, lampholders, rosettes, and receptacles shall be securely supported. A fixture that weighs more than 6 pounds (2.72 kg) or exceeds 16 inches (406 mm) in any dimension shall not be supported by the screw shell of a lampholder.

(iii) Portable lamps. Portable lamps shall be wired with flexible cord and an attachment plug of the polarized or grounding type. If the portable lamp uses an Edison-based lampholder, the grounded conductor shall be identified and attached to the screw shell and the identified blade of the attachment plug. In addition, portable handlamps shall comply with the following:

(A) Metal shell, paperlined lampholders shall not be used;

(B) Handlamps shall be equipped with a handle of molded composition or other insulating material;

(C) Handlamps shall be equipped with a substantial guard attached to the lampholder or handle;

(D) Metallic guards shall be grounded by the means of an equipment grounding conductor run within the power supply cord.

(iv) Lampholders. Lampholders of the screw-shell type shall be installed for use as lampholders only. Lampholders installed in wet or damp locations shall be of the weather-proof type.

(v) Fixtures. Fixtures installed in wet or damp locations shall be identified for the purpose and shall be installed so that water cannot enter or accumulate in wireways, lampholders, or other electrical parts.

(b) Receptacles, cord connectors, and attachment plugs (caps).

(i) Configuration. Receptacles, cord connectors, and attachment plugs shall be constructed so that no receptacle or cord connector will accept an attachment plug with a different voltage or current rating than that for which the device is intended. However, a 20-ampere T-slot receptacle or cord connector may accept a 15-ampere attachment plug of the same voltage rating. Receptacles connected to circuits having different voltages, frequencies, or types of current (AC or DC) on the same premises shall be of such design that the attachment plugs used on these circuits are not interchangeable.

(ii) Damp and wet locations. A receptacle installed in a wet or damp location shall be designed for the location.

(c) Appliances.

(i) Live parts. Appliances, other than those in which the current-carrying parts at high temperatures are necessarily exposed, shall have no live parts normally exposed to employee contact.

(ii) Disconnecting means. A means shall be provided to disconnect each appliance.

(iii) Rating. Each appliance shall be marked with its rating in volts and amperes or volts and watts.

(d) Motors. This subdivision applies to motors, motor circuits, and controllers.

(i) In sight from. If specified that one piece of equipment shall be "in sight from" another piece of equipment, one shall be visible and not more than 50 feet (15.2 m) from the other.

(ii) Disconnecting means.

(A) A disconnecting means shall be located in sight from the controller location. The controller disconnecting means for motor branch circuits over 600 volts, nominal, may be out of sight of the controller, if the controller is marked with a warning label giving the location and identification of the disconnecting means which is to be locked in the open position.

(B) The disconnecting means shall disconnect the motor and the controller from all ungrounded supply conductors and shall be so designed that no pole can be operated independently.

(C) If a motor and the driven machinery are not in sight from the controller location, the installation shall comply with one of the following conditions:

(I) The controller disconnecting means shall be capable of being locked in the open position.

(II) A manually operable switch that will disconnect the motor from its source of supply shall be placed in sight from the motor location.

(D) The disconnecting means shall plainly indicate whether it is in the open (off) or closed (on) position.

(E) The disconnecting means shall be readily accessible. If more than one disconnect is provided for the same equipment, only one need be readily accessible.

(F) An individual disconnecting means shall be provided for each motor, but a single disconnecting means may be used for a group of motors under any one of the following conditions:

(I) If a number of motors drive special parts of a single machine or piece of apparatus, such as a metal or woodworking machine, crane, or hoist;

(II) If a group of motors is under the protection of one set of branch-circuit protective devices; or

(III) If a group of motors is in a single room in sight from the location of the disconnecting means.

(iii) Motor overload, short-circuit, and ground-fault protection. Motors, motor-control apparatus, and motor branch-circuit conductors shall be protected against overheating due to motor overloads or failure to start, and against short-circuits or ground faults. These provisions do not require overload protection that will stop a motor where a shutdown is likely to introduce additional or increased hazards, as in the case of fire pumps, or where continued operation of a motor is necessary for a safe shutdown of equipment or process and motor overload sensing devices are connected to a supervised alarm.

(iv) Protection of live parts—all voltages.

(A) Stationary motors having commutators, collectors, and brush rigging located inside of motor end brackets and not conductively connected to supply circuits operating at more than 150 volts to ground need not have such parts guarded. Exposed live parts of motors and controllers operating at 50 volts or more between terminals shall be guarded against accidental contact by any of the following:

(I) By installation in a room or enclosure that is accessible only to qualified persons;

(II) By installation on a balcony, gallery, or platform, so elevated and arranged as to exclude unqualified persons; or

(III) By elevation 8 feet (2.44 m) or more above the floor.

(B) Where live parts of motors or controllers operating at over 150 volts to ground are guarded against accidental contact only by location, and where adjustment or other attendance may be necessary during the operation of the apparatus, insulating mats or platforms shall be provided so that the attendant cannot readily touch live parts unless standing on the mats or platforms.

(e) Transformers.

(i) Application. The following subsections cover the installation of all transformers, except:

(A) Current transformers;

(B) Dry-type transformers installed as a component part of other apparatus;

(C) Transformers which are an integral part of an x-ray, high frequency, or electrostatic-coating apparatus;

(D) Transformers used with Class 2 and Class 3 circuits, sign and outline lighting, electric discharge lighting, and power-limited fire-protective signaling circuits.

(ii) Operating voltage. The operating voltage of exposed live parts of transformer installations shall be indicated by warning signs or visible markings on the equipment or structure.

(iii) Transformers over 35 kV. Dry-type, high fire point liquid-insulated, and askarel-insulated transformers installed indoors and rated over 35 kV shall be in a vault.

(iv) Oil-insulated transformers. If they present a fire hazard to employees, oil-insulated transformers installed indoors shall be in a vault.

(v) Fire protection. Combustible material, combustible buildings and parts of buildings, fire escapes, and door and window openings shall be safeguarded from fires which may originate in oil-insulated transformers attached to or adjacent to a building or combustible material.

(vi) Transformer vaults. Transformer vaults shall be constructed so as to contain fire and combustible liquids within the vault and to prevent unauthorized access. Locks and latches shall be so arranged that a vault door can be readily opened from the inside.

(vii) Pipes and ducts. Any pipe or duct system foreign to the vault installation shall not enter or pass through a transformer vault.

(viii) Material storage. Materials shall not be stored in transformer vaults.

(f) Capacitors.

(i) Drainage of stored charge. All capacitors, except surge capacitors or capacitors included as a component part of other apparatus, shall be provided with an automatic means of draining the stored charge and maintaining the discharged state after the capacitor is disconnected from its source of supply.

(ii) Over 600 volts. Capacitors rated over 600 volts, nominal, shall comply with the following additional requirements:

(A) Isolating or disconnecting switches (with no interrupting rating) shall be interlocked with the load interrupting device or shall be provided with prominently displayed caution signs to prevent switching load current.

(B) For series capacitors the proper switching shall be assured by use of at least one of the following:

(I) Mechanically sequenced isolating and bypass switches;

(II) Interlocks; or

(III) Switching procedure prominently displayed at the switching location.

[Statutory Authority: Chapter 49.17 RCW. 93-19-142 (Order 93-04), § 296-155-449, filed 9/22/93, effective 11/1/93; 92-23-017 (Order 92-13), § 296-155-449, filed 11/10/92, effective 12/18/92; 88-11-021 (Order 88-04), § 296-155-449, filed 5/11/88.]

WAC 296-155-452 Specific purpose equipment and installations. (1) Cranes and hoists. This subsection applies to the installation of electric equipment and wiring used in connection with cranes, monorail hoists, hoists, and all runways.

(a) Disconnecting means.

(i) Runway conductor disconnecting means. A readily accessible disconnecting means shall be provided between the runway contact conductors and the power supply.

(ii) Disconnecting means for cranes and monorail hoists. A disconnecting means, capable of being locked in the open position, shall be provided in the leads from the runway contact conductors or other power supply on any crane or monorail hoist.

(A) If this additional disconnecting means is not readily accessible from the crane or monorail hoist operating station, means shall be provided at the operating station to open the power circuit to all motors of the crane or monorail hoist.

(B) The additional disconnect may be omitted if a monorail hoist or hand-propelled crane bridge installation meets all of the following:

(I) The unit is floor controlled;

(II) The unit is within view of the power supply disconnecting means; and

(III) No fixed work platform has been provided for servicing the unit.

(b) Control. A limit switch or other device shall be provided to prevent the load block from passing the safe upper limit of travel of any hoisting mechanism.

(c) Clearance. The dimension of the working space in the direction of access to live parts which may require examination, adjustment, servicing, or maintenance while alive shall be a minimum of 2 feet 6 inches (762 mm). Where controls are enclosed in cabinets, the door(s) shall open at least 90 degrees or be removable, or the installation shall provide equivalent access.

(d) Grounding. All exposed metal parts of cranes, monorail hoists, hoists and accessories including pendant controls shall be metallically joined together into a continuous electrical conductor so that the entire crane or hoist will be grounded in accordance with WAC 296-155-434(6). Moving parts, other than removable accessories or attachments, having metal-to-metal bearing surfaces shall be considered to be electrically connected to each other through the bearing surfaces for grounding purposes. The trolley frame and bridge frame shall be considered as electrically grounded through the bridge and trolley wheels and its respective tracks unless conditions such as paint or other insulating materials prevent reliable metal-to-metal contact. In this case a separate bonding conductor shall be provided.

(2) Elevators, escalators, and moving walks.

(a) Disconnecting means. Elevators, escalators, and moving walks shall have a single means for disconnecting all ungrounded main power supply conductors for each unit.

(b) Control panels. If control panels are not located in the same space as the drive machine, they shall be located in cabinets with doors or panels capable of being locked closed.

(3) Electric welders—disconnecting means.

(a) Motor-generator, AC transformer, and DC rectifier arc welders. A disconnecting means shall be provided in the supply circuit for each motor-generator arc welder, and for each AC transformer and DC rectifier arc welder which is not equipped with a disconnect mounted as an integral part of the welder.

(b) Resistance welders. A switch or circuit breaker shall be provided by which each resistance welder and its control equipment can be isolated from the supply circuit. The ampere rating of this disconnecting means shall not be less than the supply conductor ampacity.

(4) X-ray equipment.

(a) Disconnecting means.

(i) General. A disconnecting means shall be provided in the supply circuit. The disconnecting means shall be operable from a location readily accessible from the x-ray control. For equipment connected to a 120-volt branch circuit of 30 amperes or less, a grounding-type attachment plug cap and receptacle of proper rating may serve as a disconnecting means.

(ii) More than one piece of equipment. If more than one piece of equipment is operated from the same high-voltage circuit, each piece or each group of equipment as a unit shall be provided with a high-voltage switch or equivalent disconnecting means. This disconnecting means shall be constructed, enclosed, or located so as to avoid contact by employees with its live parts.

(b) Control-radiographic and fluoroscopic types. Radiographic and fluoroscopic-type equipment shall be effectively enclosed or shall have interlocks that deenergize the equipment automatically to prevent ready access to live current-carrying parts.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-452, filed 5/11/88.]

WAC 296-155-456 Hazardous (classified) locations.

(1) Scope. This section sets forth requirements for electric equipment and wiring in locations which are classified depending on the properties of the flammable vapors, liquids or gases, or combustible dusts or fibers which may be present therein and the likelihood that a flammable or combustible concentration or quantity is present. Each room, section or area shall be considered individually in determining its classification. These hazardous (classified) locations are assigned six designations as follows: Class I, Division 1; Class I, Division 2; Class II, Division 1; Class II, Division 2; Class III, Division 1; Class III, Division 2. For definitions of these locations see WAC 296-155-428. All applicable requirements in this part apply to all hazardous (classified) locations, unless modified by provisions of this section.

(a) All components and utilization equipment used in a hazardous location shall be chosen from among those listed by a nationally recognized testing laboratory, such as Under-

writers' Laboratories, Inc., or Factory Mutual Engineering Corp., except custom-made components and utilization equipment.

(b) Equipment approved for a specific hazardous location shall not be installed or intermixed with equipment approved for another specific hazardous location.

(2) Electrical installations. Equipment, wiring methods, and installations of equipment in hazardous (classified) locations shall be approved as intrinsically safe or approved for the hazardous (classified) location or safe for the hazardous (classified) location. Requirements for each of these options are as follows:

(a) Intrinsically safe. Equipment and associated wiring approved as intrinsically safe is permitted in any hazardous (classified) location included in its listing or labeling.

(b) Approved for the hazardous (classified) location.

(i) General. Equipment shall be approved not only for the class of location but also for the ignitable or combustible properties of the specific gas, vapor, dust, or fiber that will be present.

Note: NFPA 70, the National Electrical Code, lists or defines hazardous gases, vapors, and dusts by "groups" characterized by their ignitable or combustible properties.

(ii) Marking. Equipment shall not be used unless it is marked to show the class, group, and operating temperature or temperature range, based on operation in a 40°C ambient, for which it is approved. The temperature marking shall not exceed the ignition temperature of the specific gas, vapor, or dust to be encountered. However, the following provisions modify this marking requirement for specific equipment:

(A) Equipment of the nonheat-producing type (such as junction boxes, conduit, and fitting) and equipment of the heat-producing type having a maximum temperature of not more than 100°C (212°F) need not have a marked operating temperature or temperature range.

(B) Fixed lighting fixtures marked for use only in Class I, Division 2 locations need not be marked to indicate the group.

(C) Fixed general-purpose equipment in Class I locations, other than lighting fixtures, which is acceptable for use in Class I, Division 2 locations need not be marked with the class, group, division, or operating temperature.

(D) Fixed dust-tight equipment, other than lighting fixtures, which is acceptable for use in Class II, Division 2 and Class III locations need not be marked with the class, group, division, or operating temperature.

(c) Safe for the hazardous (classified) location. Equipment which is safe for the location shall be of a type and design which the employer demonstrates will provide protection from the hazards arising from the combustibility and flammability of vapors, liquids, gases, dusts, or fibers.

Note: The National Electrical Code, NFPA 70, contains guidelines for determining the type and design of equipment and installations which will meet this requirement. The guidelines of this document address electric wiring, equipment, and systems installed in hazardous (classified) locations and contain specific provisions for the following: Wiring methods, wiring connections, conductor insulation, flexible cords, sealing and drainage, transformers, capacitors, switches, circuit breakers, fuses, motor controllers, receptacles, attachment plugs, meters, relays, instruments, resis-

tors, generators, motors, lighting fixtures, storage battery charging equipment, electric cranes, electric hoists and similar equipment, utilization equipment, signaling systems, alarm systems, remote control systems, local loud speaker and communication systems, ventilation piping, live parts, lightning surge protection, and grounding. Compliance with these guidelines will constitute one means, but not the only means, of compliance with this subsection.

(3) Conduits. All conduits shall be threaded and shall be made wrench-tight. Where it is impractical to make a threaded joint tight, a bonding jumper shall be utilized.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-456, filed 5/11/88.]

WAC 296-155-459 Special systems. (1) Systems over 600 volts, nominal. (a) through (d) of this subsection contain general requirements for all circuits and equipment operated at over 600 volts.

(a) Wiring methods for fixed installations.

(i) Above ground. Above-ground conductors shall be installed in rigid metal conduit, in intermediate metal conduit, in cable trays, in cablebus, in other suitable raceways, or as open runs of metal-clad cable designed for the use and purpose. However, open runs of nonmetallic-sheathed cable or of bare conductors or busbars may be installed in locations which are accessible only to qualified persons. Metallic shielding components, such as tapes, wires, or braids for conductors, shall be grounded. Open runs of insulated wires and cables having a bare lead sheath or a braided outer covering shall be supported in a manner designed to prevent physical damage to the braid or sheath.

(ii) Installations emerging from the ground. Conductors emerging from the ground shall be enclosed in raceways. Raceways installed on poles shall be of rigid metal conduit, intermediate metal conduit, PVC schedule 80 or equivalent extending from the ground line up to a point 8 feet (2.44 m) above finished grade. Conductors entering a building shall be protected by an enclosure from the ground line to the point of entrance. Metallic enclosures shall be grounded.

(b) Interrupting and isolating devices.

(i) Circuit breakers. Circuit breakers located indoors shall consist of metal-enclosed or fire-resistant, cell-mounted units. In locations accessible only to qualified personnel, open mounting of circuit breakers is permitted. A means of indicating the open and closed position of circuit breakers shall be provided.

(ii) Fused cutouts. Fused cutouts installed in buildings or transformer vaults shall be of a type identified for the purpose. They shall be readily accessible for fuse replacement.

(iii) Equipment isolating means. A means shall be provided to completely isolate equipment for inspection and repairs. Isolating means which are not designed to interrupt the load current of the circuit shall be either interlocked with a circuit interrupter or provided with a sign warning against opening them under load.

(c) Mobile and portable equipment.

(i) Power cable connections to mobile machines. A metallic enclosure shall be provided on the mobile machine for enclosing the terminals of the power cable. The enclosure shall include provisions for a solid connection for the ground wire(s) terminal to ground effectively the machine frame.

The method of cable termination used shall prevent any strain or pull on the cable from stressing the electrical connections. The enclosure shall have provision for locking so only authorized qualified persons may open it and shall be marked with a sign warning of the presence of energized parts.

(ii) Guarding live parts. All energized switching and control parts shall be enclosed in effectively grounded metal cabinets or enclosures. Circuit breakers and protective equipment shall have the operating means projecting through the metal cabinet or enclosure so these units can be reset without locked doors being opened. Enclosures and metal cabinets shall be locked so that only authorized qualified persons have access and shall be marked with a sign warning of the presence of energized parts. Collector ring assemblies on revolving-type machines (shovels, draglines, etc.) shall be guarded.

(d) Tunnel installations.

(i) Application. The provisions of this item apply to installation and use of high-voltage power distribution and utilization equipment which is associated with tunnels and which is portable and/or mobile, such as substations, trailers, cars, mobile shovels, draglines, hoists, drills, dredges, compressors, pumps, conveyors, and underground excavators.

(ii) Conductors. Conductors in tunnels shall be installed in one or more of the following:

(A) Metal conduit or other metal raceway;

(B) Type MC cable; or

(C) Other suitable multiconductor cable.

Conductors shall also be so located or guarded as to protect them from physical damage. Multiconductor portable cable may supply mobile equipment. An equipment grounding conductor shall be run with circuit conductors inside the metal raceway or inside the multiconductor cable jacket. The equipment grounding conductor may be insulated or bare.

(iii) Guarding live parts. Bare terminals of transformers, switches, motor controllers, and other equipment shall be enclosed to prevent accidental contact with energized parts. Enclosures for use in tunnels shall be drip-proof, weather-proof, or submersible as required by the environmental conditions.

(iv) Disconnecting means. A disconnecting means that simultaneously opens all ungrounded conductors shall be installed at each transformer or motor location.

(v) Grounding and bonding. All nonenergized metal parts of electric equipment and metal raceways and cable sheaths shall be grounded and bonded to all metal pipes and rails at the portal and at intervals not exceeding 1000 feet (305 m) throughout the tunnel.

(2) Class 1, Class 2, and Class 3 remote control, signaling, and power-limited circuits.

(a) Classification. Class 1, Class 2, or Class 3 remote control, signaling, or power-limited circuits are characterized by their usage and electrical power limitation which differentiates them from light and power circuits. These circuits are classified in accordance with their respective voltage and power limitations as summarized in (a)(i) through (iii) of this subsection.

(i) Class 1 circuits.

(A) A Class 1 power-limited circuit is supplied from a source having a rated output of not more than 30 volts and 1000 volt-amperes.

(B) A Class 1 remote control circuit or a Class 1 signaling circuit has a voltage which does not exceed 600 volts; however, the power output of the source need not be limited.

(ii) Class 2 and Class 3 circuits.

(A) Power for Class 2 and Class 3 circuits is limited either inherently (in which no overcurrent protection is required) or by a combination of a power source and overcurrent protection.

(B) The maximum circuit voltage is 150 volts AC or DC for a Class 2 inherently limited power source, and 100 volts AC or DC for a Class 3 inherently limited power source.

(C) The maximum circuit voltage is 30 volts AC and 60 volts DC for a Class 2 power source limited by overcurrent protection, and 150 volts AC or DC for a Class 3 power source limited by overcurrent protection.

(iii) Application. The maximum circuit voltages in (a)(i) and (ii) of this subsection apply to sinusoidal AC or continuous DC power sources, and where wet contact occurrence is not likely.

(b) Marking. A Class 2 or Class 3 power supply unit shall not be used unless it is durably marked where plainly visible to indicate the class of supply and its electrical rating.

(3) Communications systems.

(a) Scope. These provisions for communication systems apply to such systems as central-station-connected and non-central-station-connected telephone circuits, radio receiving and transmitting equipment, and outside wiring for fire and burglar alarm, and similar central station systems. These installations need not comply with the provisions of WAC 296-155-444 through 296-155-459(2), except WAC 296-155-447 (3)(a)(ii) and 296-155-456.

(b) Protective devices.

(i) Circuits exposed to power conductors. Communication circuits so located as to be exposed to accidental contact with light or power conductors operating at over 300 volts shall have each circuit so exposed provided with an approved protector.

(ii) Antenna lead-ins. Each conductor of a lead-in from an outdoor antenna shall be provided with an antenna discharge unit or other means that will drain static charges from the antenna system.

(c) Conductor location.

(i) Outside of buildings.

(A) Receiving distribution lead-in or aerial-drop cables attached to buildings and lead-in conductors to radio transmitters shall be so installed as to avoid the possibility of accidental contact with electric light or power conductors.

(B) The clearance between lead-in conductors and any lightning protection conductors shall not be less than 6 feet (1.83 m).

(ii) On poles. Where practicable, communication conductors on poles shall be located below the light or power conductors. Communications conductors shall not be attached to a crossarm that carries light or power conductors.

(iii) Inside of buildings. Indoor antennas, lead-ins, and other communication conductors attached as open conductors to the inside of buildings shall be located at least 2 inches (50.8 mm) from conductors of any light or power or Class 1 circuits unless a special and equally protective method of conductor separation is employed.

(d) Equipment location. Outdoor metal structures supporting antennas, as well as self-supporting antennas such as vertical rods or dipole structures, shall be located as far away from overhead conductors of electric light and power circuits of over 150 volts to ground as necessary to avoid the possibility of the antenna or structure falling into or making accidental contact with such circuits.

(e) Grounding.

(i) Lead-in conductors. If exposed to contact with electric light or power conductors, the metal sheath of aerial cables entering buildings shall be grounded or shall be interrupted close to the entrance to the building by an insulating joint or equivalent device. Where protective devices are used, they shall be grounded.

(ii) Antenna structures. Masts and metal structures supporting antennas shall be permanently and effectively grounded without splice or connection in the grounding conductor.

(iii) Equipment enclosures. Transmitters shall be enclosed in a metal frame or grill or separated from the operating space by a barrier, all metallic parts of which are effectively connected to ground. All external metal handles and controls accessible to the operating personnel shall be effectively grounded. Unpowered equipment and enclosures shall be considered grounded where connected to an attached coaxial cable with an effectively grounded metallic shield.

[Statutory Authority: Chapter 49.17 RCW. 93-19-142 (Order 93-04), § 296-155-459, filed 9/22/93, effective 11/1/93; 88-11-021 (Order 88-04), § 296-155-459, filed 5/11/88.]

WAC 296-155-462 Definitions applicable to this part.

The definitions given in this section apply to the terms used in Part I. The definitions given here for "approved" and "qualified person" apply, instead of the definitions given in WAC 296-155-012, to the use of these terms in Part I.

(1) "Acceptable." An installation or equipment is acceptable to the director, and approved within the meaning of this Part I:

(a) If it is accepted, certified, listed, labeled, or otherwise determined to be safe by a qualified testing laboratory capable of determining the suitability of materials and equipment for installation and use in accordance with this standard; or

(b) With respect to an installation or equipment of a kind which no qualified testing laboratory accepts, certifies, lists, labels, or determines to be safe, if it is inspected or tested by another state agency, or by a federal, municipal, or other local authority responsible for enforcing occupational safety provisions of the National Electrical Code, and found in compliance with those provisions; or

(c) With respect to custom-made equipment or related installations which are designed, fabricated for, and intended for use by a particular customer, if it is determined to be safe for its intended use by its manufacturer on the basis of test data which the employer keeps and makes available for inspection to the director and his/her authorized representatives.

(2) "Accepted." An installation is "accepted" if it has been inspected and found to be safe by a qualified testing laboratory.

(3) "Accessible." (As applied to wiring methods.) Capable of being removed or exposed without damaging the build-

ing structure or finish, or not permanently closed in by the structure or finish of the building. (See "concealed" and "exposed.")

(4) "Accessible." (As applied to equipment.) Admitting close approach; not guarded by locked doors, elevation, or other effective means. (See "readily accessible.")

(5) "Ampacity." The current in amperes a conductor can carry continuously under the conditions of use without exceeding its temperature rating.

(6) "Appliances." Utilization equipment, generally other than industrial, normally built in standardized sizes or types, which is installed or connected as a unit to perform one or more functions.

(7) "Approved." Approved by the director of the department of labor and industries or his/her authorized representative: Provided, however, That should a provision of this chapter state that approval by an agency or organization other than the department of labor and industries is required, such as Underwriters' Laboratories, the Bureau of Mines, or Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) the provisions of WAC 296-155-006 shall apply.

(8) "Askarel." A generic term for a group of nonflammable synthetic chlorinated hydrocarbons used as electrical insulating media. Askarels of various compositional types are used. Under arcing conditions the gases produced, while consisting predominantly of noncombustible hydrogen chloride, can include varying amounts of combustible gases depending upon the askarel type.

(9) "Attachment plug (plug cap) (cap)." A device which, by insertion in a receptacle, establishes connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.

(10) "Automatic." Self-acting, operating by its own mechanism when actuated by some impersonal influence, as for example, a change in current strength, pressure, temperature, or mechanical configuration.

(11) "Bare conductor." See "conductor."

(12) "Bonding." The permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to conduct safely any current likely to be imposed.

(13) "Bonding jumper." A reliable conductor to assure the required electrical conductivity between metal parts required to be electrically connected.

(14) "Branch circuits." That portion of a wiring system extending beyond the final overcurrent device protecting the circuit. (A device not approved for branch circuit protection, such as thermal cutout or motor overload protective device, is not considered as the overcurrent device protecting the circuit.)

(15) "Building." A structure which stands alone or which is cut off from adjoining structures by fire walls with all openings therein protected by approved fire doors.

(16) "Cabinet." An enclosure designed either for surface or flush mounting, and provided with a frame, mat, or trim in which a swinging door or doors are or may be hung.

(17) "Certified." Equipment is "certified" if it:

(a) Has been tested and found by a qualified testing laboratory to meet applicable test standards or to be safe for use in a specified manner; and

(b) Is of a kind whose production is periodically inspected by a qualified testing laboratory. Certified equipment must bear a label, tag, or other record of certification.

(18) "Circuit breaker."

(a) (600 volts nominal, or less.) A device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined overcurrent without injury to itself when properly applied within its rating.

(b) (Over 600 volts, nominal.) A switching device capable of making, carrying, and breaking currents under normal circuit conditions, and also making, carrying for a specified time, and breaking currents under specified abnormal circuit conditions, such as those of short circuit.

(19) "Class I locations." Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. Class I locations include the following:

(a) Class I, Division 1. A Class I, Division 1 location is a location:

(i) In which ignitable concentrations of flammable gases or vapors may exist under normal operating conditions; or

(ii) In which ignitable concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or

(iii) In which breakdown or faulty operation of equipment or processes might release ignitable concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment.

Note: This classification usually includes locations where volatile flammable liquids or liquefied flammable gases are transferred from one container to another; interiors of spray booths and areas in the vicinity of spraying and painting operations where volatile flammable solvents are used; locations containing open tanks or vats of volatile flammable liquids; drying rooms or compartments for the evaporation of flammable solvents; inadequately ventilated pump rooms for flammable gas or for volatile flammable liquids; and all other locations where ignitable concentrations of flammable vapors or gases are likely to occur in the course of normal operations.

(b) Class I, Division 2. A Class I, Division 2 location is a location:

(i) In which volatile flammable liquids or flammable gases are handled, processed, or used, but in which the hazardous liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in case of abnormal operation of equipment; or

(ii) In which ignitable concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operations of the ventilating equipment; or

(iii) That is adjacent to a Class I, Division 1 location, and to which ignitable concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a

source of clean air, and effective safeguards against ventilation failure are provided.

Note: This classification usually includes locations where volatile flammable liquids or flammable gases or vapors are used, but which would become hazardous only in case of an accident or of some unusual operating condition. The quantity of flammable material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the record of the industry or business with respect to explosions or fires are all factors that merit consideration in determining the classification and extent of each location.

Piping without valves, checks, meters, and similar devices would not ordinarily introduce a hazardous condition even though used for flammable liquids or gases. Locations used for the storage of flammable liquids or of liquefied or compressed gases in sealed containers would not normally be considered hazardous unless also subject to other hazardous conditions.

Electrical conduits and their associated enclosures separated from process fluids by a single seal or barrier are classed as a Division 2 location if the outside of the conduit and enclosures is a nonhazardous location.

(20) "Class II locations." Class II locations are those that are hazardous because of the presence of combustible dust. Class II locations include the following:

(a) Class II, Division 1. A Class II, Division 1 location is a location:

(i) In which combustible dust is or may be in suspension in the air under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures; or

(ii) Where mechanical failure or abnormal operation of machinery or equipment might cause such explosive or ignitable mixtures to be produced, and might also provide a source of ignition through simultaneous failure of electric equipment, operation of protection devices, or from other causes; or

(iii) In which combustible dusts of an electrically conductive nature may be present.

Note: Combustible dusts which are electrically nonconductive include dusts produced in the handling and processing of grain and grain products, pulverized sugar and cocoa, dried egg and milk powders, pulverized spices, starch and pastes, potato and woodflour, oil meal from beans and seed, dried hay, and other organic materials which may produce combustible dusts when processed or handled. Dusts containing magnesium or aluminum are particularly hazardous and the use of extreme caution is necessary to avoid ignition and explosion.

(b) Class II, Division 2. A Class II, Division 2 location is a location in which:

(i) Combustible dust will not normally be in suspension in the air in quantities sufficient to produce explosive or ignitable mixtures, and dust accumulations are normally insufficient to interfere with the normal operation of electrical equipment or other apparatus; or

(ii) Dust may be in suspension in the air as a result of infrequent malfunctioning of handling or processing equipment, and dust accumulations resulting therefrom may be ignitable by abnormal operation or failure of electrical equipment or other apparatus.

Note: This classification includes locations where dangerous concentrations of suspended dust would not be likely but where dust accumulations might form on or in the vicinity of electric equipment. These areas may contain equipment from which appreciable quantities of dust would escape under abnormal operating conditions or be adjacent to a Class II, Division 1 location, as described above, into which an explosive or ignitable concentration of dust may be put into suspension under abnormal operating conditions.

(21) "Class III locations." Class III locations are those that are hazardous because of the presence of easily ignitable fibers or flyings but in which such fibers or flyings are not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures. Class III locations include the following:

(a) Class III, Division 1. A Class III, Division 1 location is a location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.

Note: Easily ignitable fibers and flyings include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fiber, oakum, baled waste kapok, Spanish moss, excelsior, sawdust, woodchips, and other material of similar nature.

(b) Class III, Division 2. A Class III, Division 2 location is a location in which easily ignitable fibers are stored or handled, except in process of manufacture. Collector ring. A collector ring is an assembly of slip rings for transferring electrical energy from a stationary to a rotating member.

(22) "Collector ring." A collector ring is an assembly of slip rings for transferring electrical energy from a stationary to a rotating member.

(23) "Concealed." Rendered inaccessible by the structure or finish of the building. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them. See "accessible. (As applied to wiring methods.)"

(24) "Conductor."

(a) Bare. A conductor having no covering or electrical insulation whatsoever.

(b) Covered. A conductor encased within material of composition or thickness that is not recognized as electrical insulation.

(c) Insulated. A conductor encased within material of composition and thickness that is recognized as electrical insulation.

(25) "Controller." A device or group of devices that serves to govern, in some predetermined manner, the electric power delivered to the apparatus to which it is connected.

(26) "Covered conductor." See "conductor."

(27) "Cutout." (Over 600 volts, nominal.) An assembly of a fuse support with either a fuseholder, fuse carrier, or disconnecting blade. The fuseholder or fuse carrier may include a conducting element (fuse link), or may act as the disconnecting blade by the inclusion of a nonfusible member.

(28) "Cutout box." An enclosure designed for surface mounting and having swinging doors or covers secured directly to and telescoping with the walls of the box proper. (See "cabinet.")

(29) "Damp location." See "location."

(30) "Dead front." Without live parts exposed to a person on the operating side of the equipment.

(31) "Device." A unit of an electrical system which is intended to carry but not utilize electric energy.

(32) "Disconnecting means." A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

(33) "Disconnecting (or isolating) switch." (Over 600 volts, nominal.) A mechanical switching device used for isolating a circuit or equipment from a source of power.

(34) "Dry location." See "location."

(35) "Enclosed." Surrounded by a case, housing, fence or walls which will prevent persons from accidentally contacting energized parts.

(36) "Enclosure." The case or housing of apparatus, or the fence or walls surrounding an installation to prevent personnel from accidentally contacting energized parts, or to protect the equipment from physical damage.

(37) "Equipment." A general term including material, fittings, devices, appliances, fixtures, apparatus, and the like, used as a part of, or in connection with, an electrical installation.

(38) "Equipment grounding conductor." See "grounding conductor, equipment."

(39) "Explosion-proof apparatus." Apparatus enclosed in a case that is capable of withstanding an explosion of a specified gas or vapor which may occur within it and of preventing the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and which operates at such an external temperature that it will not ignite a surrounding flammable atmosphere.

(40) "Exposed. (As applied to live parts.)" Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated. (See "accessible" and "concealed.")

(41) "Exposed. (As applied to wiring methods.)" On or attached to the surface or behind panels designed to allow access. See "accessible. (As applied to wiring methods.)"

(42) "Exposed. (For the purposes of WAC 296-155-459(3), Communications systems.)" Where the circuit is in such a position that in case of failure of supports or insulation, contact with another circuit may result.

(43) "Externally operable." Capable of being operated without exposing the operator to contact with live parts.

(44) "Feeder." All circuit conductors between the service equipment, or the generator switchboard of an isolated plant, and the final branch-circuit overcurrent device.

(45) "Festoon lighting." A string of outdoor lights suspended between two points more than 15 feet (4.57 m) apart.

(46) "Fitting." An accessory such as a locknut, bushing, or other part of a wiring system that is intended primarily to perform a mechanical rather than an electrical function.

(47) "Fuse." (Over 600 volts, nominal.) An overcurrent protective device with a circuit opening fusible part that is heated and severed by the passage of overcurrent through it. A fuse comprises all the parts that form a unit capable of performing the prescribed functions. It may or may not be the complete device necessary to connect it into an electrical circuit.

(48) "Ground." A conducting connection, whether intentional or accidental, between an electrical circuit or equip-

ment and the earth, or to some conducting body that serves in place of the earth.

(49) "Grounded." Connected to earth or to some conducting body that serves in place of the earth.

(50) "Grounded, effectively." (Over 600 volts, nominal.) Permanently connected to earth through a ground connection of sufficiently low impedance and having sufficient ampacity that ground fault current which may occur cannot build up to voltages dangerous to personnel.

(51) "Grounded conductor." A system or circuit conductor that is intentionally grounded.

(52) "Grounding conductor." A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes.

(53) "Grounding conductor, equipment." The conductor used to connect the noncurrent-carrying metal parts of equipment, raceways, and other enclosures to the system grounded conductor and/or the grounding electrode conductor at the service equipment or at the source of a separately derived system.

(54) "Grounding electrode conductor." The conductor used to connect the grounding electrode to the equipment grounding conductor and/or to the grounded conductor of the circuit at the service equipment or at the source of a separately derived system.

(55) "Ground-fault circuit interrupter." A device for the protection of personnel that functions to deenergize a circuit or portion thereof within an established period of time when a current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit.

(56) "Guarded." Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to remove the likelihood of approach to a point of danger or contact by persons or objects.

(57) "Hazard." That condition, potential or inherent, which is likely to cause injury, death, or occupational disease.

(58) "Hoistway." Any shaftway, hatchway, well hole, or other vertical opening or space in which an elevator or dumbwaiter is designed to operate.

(59) "Identified (conductors or terminals)." Identified, as used in reference to a conductor or its terminal, means that such conductor or terminal can be recognized as grounded.

(60) "Identified (for the use)." Recognized as suitable for the specific purpose, function, use, environment, application, etc., where described as a requirement in this standard. Suitability of equipment for a specific purpose, environment, or application is determined by a qualified testing laboratory where such identification includes labeling or listing.

(61) "Insulated conductor." See "conductor."

(62) "Interrupter switch." (Over 600 volts, nominal.) A switch capable of making, carrying, and interrupting specified currents.

(63) "Intrinsically safe equipment and associated wiring." Equipment and associated wiring in which any spark or thermal effect, produced either normally or in specified fault conditions, is incapable, under certain prescribed test conditions, of causing ignition of a mixture of flammable or com-

bustible material in air in its most easily ignitable concentration.

(64) "Isolated." Not readily accessible to persons unless special means for access are used.

(65) "Isolated power system." A system comprising an isolating transformer or its equivalent, a line isolation monitor, and its ungrounded circuit conductors.

(66) "J-Box (junction box)." An electrical sheet metal enclosure with openings for conduit or cable with sheet metal cover. The primary purpose is for joining conductors for splicing.

(67) "Labeled." Equipment or materials to which has been attached a label, symbol or other identifying mark of a qualified testing laboratory which indicates compliance with appropriate standards or performance in a specified manner.

(68) "Lighting outlet." An outlet intended for the direct connection of a lampholder, a lighting fixture, or a pendant cord terminating in a lampholder.

(69) "Listed." Equipment or materials included in a list published by a qualified testing laboratory whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

(70) "Location."

(a) Damp location. Partially protected locations under canopies, marquees, roofed open porches, and like locations, and interior locations subject to moderate degrees of moisture, such as some basements.

(b) Dry location. A location not normally subject to dampness or wetness. A location classified as dry may be temporarily subject to dampness or wetness, as in the case of a building under construction.

(c) Wet location. Installations underground or in concrete slabs or masonry in direct contact with the earth, and locations subject to saturation with water or other liquids, such as locations exposed to weather and unprotected.

(71) "Mobile x-ray." X-ray equipment mounted on a permanent base with wheels and/or casters for moving while completely assembled.

(72) "Motor control center." An assembly of one or more enclosed sections having a common power bus and principally containing motor control units.

(73) "Outlet." A point on the wiring system at which current is taken to supply utilization equipment.

(74) "Overcurrent." Any current in excess of the rated current of equipment or the ampacity of a conductor. It may result from overload (see definition), short circuit, or ground fault. A current in excess of rating may be accommodated by certain equipment and conductors for a given set of conditions. Hence the rules for overcurrent protection are specific for particular situations.

(75) "Overload." Operation of equipment in excess of normal, full load rating, or of a conductor in excess of rated ampacity which, when it persists for a sufficient length of time, would cause damage or dangerous overheating. A fault, such as a short circuit or ground fault, is not an overload. (See "overcurrent.")

(76) "Panelboard." A single panel or group of panel units designed for assembly in the form of a single panel; including buses, automatic overcurrent devices, and with or without

switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall or partition and accessible only from the front. (See "switchboard.")

(77) "Portable x-ray." X-ray equipment designed to be hand-carried.

(78) "Power fuse." (Over 600 volts, nominal.) See "fuse."

(79) "Power outlet." An enclosed assembly which may include receptacles, circuit breakers, fuseholders, fused switches, buses and watt-hour meter mounting means; intended to serve as a means for distributing power required to operate mobile or temporarily installed equipment.

(80) "Premises wiring system." That interior and exterior wiring, including power, lighting, control, and signal circuit wiring together with all of its associated hardware, fittings, and wiring devices, both permanently and temporarily installed, which extends from the load end of the service drop, or load end of the service lateral conductors to the outlet(s). Such wiring does not include wiring internal to appliances, fixtures, motors, controllers, motor control centers, and similar equipment.

(81) "Qualified person." One familiar with the construction and operation of the equipment and the hazards involved.

(82) "Qualified testing laboratory." A properly equipped and staffed testing laboratory which has capabilities for and which provides the following services:

(a) Experimental testing for safety of specified items of equipment and materials referred to in this standard to determine compliance with appropriate test standards or performance in a specified manner;

(b) Inspecting the run of such items of equipment and materials at factories for product evaluation to assure compliance with the test standards;

(c) Service-value determinations through field inspections to monitor the proper use of labels on products and with authority for recall of the label in the event a hazardous product is installed;

(d) Employing a controlled procedure for identifying the listed and/or labeled equipment or materials tested; and

(e) Rendering creditable reports or findings that are objective and without bias of the tests and test methods employed.

(83) "Raceway." A channel designed expressly for holding wires, cables, or busbars, with additional functions as permitted in this part. Raceways may be of metal or insulating material, and the term includes rigid metal conduit, rigid non-metallic conduit, intermediate metal conduit, liquidtight flexible metal conduit, flexible metallic tubing, flexible metal conduit, electrical metallic tubing, underfloor raceways, cellular concrete floor raceways, cellular metal floor raceways, surface raceways, wireways, and busways.

(84) "Readily accessible." Capable of being reached quickly for operation, renewal, or inspections, without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, chairs, etc. (See "accessible.")

(85) "Receptacle." A receptacle is a contact device installed at the outlet for the connection of a single attachment plug. A single receptacle is a single contact device with

no other contact device on the same yoke. A multiple receptacle is a single device containing two or more receptacles.

(86) "Receptacle outlet." An outlet where one or more receptacles are installed.

(87) "Remote-control circuit." Any electric circuit that controls any other circuit through a relay or an equivalent device.

(88) "Sealable equipment." Equipment enclosed in a case or cabinet that is provided with a means of sealing or locking so that live parts cannot be made accessible without opening the enclosure. The equipment may or may not be operable without opening the enclosure.

(89) "Separately derived system." A premises wiring system whose power is derived from generator, transformer, or converter windings and has no direct electrical connection, including a solidly connected grounded circuit conductor, to supply conductors originating in another system.

(90) "Service." The conductors and equipment for delivering energy from the electricity supply system to the wiring system of the premises served.

(91) "Service conductors." The supply conductors that extend from the street main or from transformers to the service equipment of the premises supplied.

(92) "Service drop." The overhead service conductors from the last pole or other aerial support to and including the splices, if any, connecting to the service-entrance conductors at the building or other structure.

(93) "Service-entrance conductors, overhead system." The service conductors between the terminals of the service equipment and a point usually outside the building, clear of building walls, where joined by tap or splice to the service drop.

(94) "Service-entrance conductors, underground system." The service conductors between the terminals of the service equipment and the point of connection to the service lateral. Where service equipment is located outside the building walls, there may be no service-entrance conductors, or they may be entirely outside the building.

(95) "Service equipment." The necessary equipment, usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors to a building or other structure, or an otherwise defined area, and intended to constitute the main control and means of cutoff of the supply.

(96) "Service raceway." The raceway that encloses the service-entrance conductors.

(97) "Shock hazard." To exist at an accessible part in a circuit between the part and ground, or other accessible parts if the potential is more than 42.4 volts peak and the current through a 1,500-ohm load is more than 5 milliamperes.

(98) "Signaling circuit." Any electric circuit that energizes signaling equipment.

(99) "Switchboard." A large single panel, frame, or assembly of panels which have switches, buses, instruments, overcurrent and other protective devices mounted on the face or back or both. Switchboards are generally accessible from the rear as well as from the front and are not intended to be installed in cabinets. (See "panelboard.")

(100) "Switches."

(a) General-use switch. A switch intended for use in general distribution and branch circuits. It is rated in amperes, and it is capable of interrupting its rated current at its rated voltage.

(b) General-use snap switch. A form of general-use switch so constructed that it can be installed in flush device boxes or on outlet box covers, or otherwise used in conjunction with wiring systems recognized by this part.

(c) Isolating switch. A switch intended for isolating an electric circuit from the source of power. It has no interrupting rating, and it is intended to be operated only after the circuit has been opened by some other means.

(d) Motor-circuit switch. A switch, rated in horsepower, capable of interrupting the maximum operating overload current of a motor of the same horsepower rating as the switch at the rated voltage.

(101) "Switching devices." (Over 600 volts, nominal.) Devices designed to close and/or open one or more electric circuits. Included in this category are circuit breakers, cut-outs, disconnecting (or isolating) switches, disconnecting means, and interrupter switches.

(102) "Transformer." A transformer is an apparatus for converting electrical power in an a-c system at one voltage or current into electrical power at some other voltage or current without the use of rotating parts.

(103) "Transportable x-ray." X-ray equipment installed in a vehicle or that may readily be disassembled for transport in a vehicle.

(104) "Utilization equipment." Utilization equipment means equipment which utilizes electric energy for mechanical, chemical, heating, lighting, or similar useful purpose.

(105) "Utilization system." A utilization system is a system which provides electric power and light for employee workplaces, and includes the premises wiring system and utilization equipment.

(106) "Ventilated." Provided with a means to permit circulation of air sufficient to remove an excess of heat, fumes, or vapors.

(107) "Volatile flammable liquid." A flammable liquid having a flash point below 38°C (100°F) or whose temperature is above its flash point, or a Class II combustible liquid having a vapor pressure not exceeding 40 psia (276 kPa) at 38°C (100°F) whose temperature is above its flash point.

(108) "Voltage." (Of a circuit.) The greatest root-mean-square (effective) difference of potential between any two conductors of the circuit concerned.

(109) "Voltage, nominal." A nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class (as 120/240, 480Y/277, 600, etc.). The actual voltage at which a circuit operates can vary from the nominal within a range that permits satisfactory operation of equipment.

(110) "Voltage to ground." For grounded circuits, the voltage between the given conductor and that point or conductor of the circuit that is grounded; for ungrounded circuits, the greatest voltage between the given conductor and any other conductor of the circuit.

(111) "Watertight." So constructed that moisture will not enter the enclosure.

(112) "Weatherproof." So constructed or protected that exposure to the weather will not interfere with successful operation. Rainproof, raintight, or watertight equipment can fulfill the requirements for weatherproof where varying weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

(113) "Wet location." See "location."

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-462, filed 7/20/94, effective 9/20/94; 93-19-142 (Order 93-04), § 296-155-462, filed 9/22/93, effective 11/1/93; 88-11-021 (Order 88-04), § 296-155-462, filed 5/11/88.]

PART J STAIRWAYS AND LADDERS

WAC 296-155-475 Scope and application. This part applies to all stairways and ladders used in construction, alteration, repair (including painting and decorating), and demolition workplaces covered under chapter 296-155 WAC, and also sets forth, in specified circumstances, when ladders and stairways are required to be provided. Additional requirements for ladders used on or with scaffolds are contained in chapter 296-155 WAC, Part J-1.

[Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-475, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-475, filed 1/21/86; Order 76-6, § 296-155-475, filed 3/1/76; Order 74-26, § 296-155-475, filed 5/7/74, effective 6/6/74.]

WAC 296-155-47501 Definitions applicable to this part. (1) Cleat means a ladder crosspiece of rectangular cross section placed on edge upon which a person may step while ascending or descending a ladder.

(2) Double-cleat ladder means a ladder similar in construction to a single-cleat ladder, but with a center rail to allow simultaneous two-way traffic for employees ascending or descending.

(3) Equivalent means alternative designs, materials, or methods that the employer can demonstrate will provide an equal or greater degree of safety for employees than the method or item specified in the standard.

(4) Extension trestle ladder means a self-supporting portable ladder, adjustable in length, consisting of a trestle ladder base and a vertically adjustable extension section, with a suitable means for locking the ladders together (also see trestle ladder).

(5) Failure means load refusal, breakage, or separation of component parts. Load refusal is the point where the structural members lose their ability to carry the loads.

(6) Fixed ladder means a ladder that cannot be readily moved or carried because it is an integral part of a building or structure. A side-step fixed ladder is a fixed ladder that requires a person getting off at the top to step to the side of the ladder side rails to reach the landing. A through fixed ladder is a fixed ladder that requires a person getting off at the top to step between the side rails of the ladder to reach the landing. For the purpose of this standard, slip forms and scaffolds with built in ladders permanently attached, are considered to be fixed ladders.

(7) Handrail means a rail used to provide employees with a handhold for support.

(8) Individual-rung/step ladders means ladders without a side rail or center rail support. Such ladders are made by mounting individual steps or rungs directly to the side or wall of the structure.

(9) Job-made ladder means a ladder that is fabricated, not commercially manufactured. This definition does not apply to any individual-rung/step ladders.

(10) Ladder types. For the purpose of this standard ladder types are defined by the following types:

Type IA - Extra heavy duty industrial use.

Type I - Heavy duty industrial use such as utilities and contractors.

Type II - Medium duty industrial use such as painters, offices, and light industrial use.

Type III - Light duty household use.

(11) Landing means any area such as the ground, roof, or platform that provides access/egress for a ladder.

(12) Lower levels means those areas to which an employee can fall from a stairway or ladder. Such areas include ground levels, floors, roofs, ramps, runways, excavations, pits, tanks, material, water, equipment, and similar surfaces. It does not include the surface from which the employee falls.

(13) Maximum intended load means the total load of all employees, equipment, tools, materials, transmitted loads, and other loads anticipated to be applied to a ladder component at any one time.

(14) Nosing means that portion of a tread projecting beyond the face of the riser immediately below.

(15) Platform means a walking/working surface for persons, elevated above the surrounding floor or ground.

(16) Point of access means all areas used by employees for work-related passage from one area or level to another. Such open areas include doorways, passageways, stairway openings, studded walls, and various other permanent or temporary openings used for such travel.

(17) Portable ladder means a ladder that can be readily moved or carried.

(18) Riser height means the vertical distance from the top of a tread to the top of the next higher tread or platform/landing or the distance from the top of a platform/landing to the top of the next higher tread or platform/landing.

(19) Side-step fixed ladder. See "fixed ladder."

(20) Single-cleat ladder means a ladder consisting of a pair of side rails, connected together by cleats, rungs, or steps.

(21) Single-rail ladder means a portable ladder with rungs, cleats, or steps mounted on a single rail instead of the normal two rails used on most other ladders. Single rail ladders are prohibited from use.

(22) Special purpose ladder means a portable ladder that represents either a modification or a combination of design or construction features in one of the general purpose types of ladders previously defined, in order to adapt the ladder to special or specific uses.

(23) Spiral stairway means a series of steps attached to a vertical pole and progressing upward in a winding fashion within a cylindrical space.

(24) Stairrail system means a vertical barrier erected along the unprotected sides and edges of a stairway to prevent employees from falling to lower levels. The top surface of a stairrail system may also be a "handrail."

(25) Step stool (ladder type) means a self-supporting, foldable, portable ladder, nonadjustable in length, 32 inches or less in overall size, with flat steps and without a pail shelf, designed to be climbed on the ladder top cap as well as all steps. The side rails may continue above the top cap.

(26) Through fixed ladder. See "fixed ladder."

(27) Tread depth means the horizontal distance from front to back of a tread (excluding nosing, if any).

(28) Trestle ladder means a self-supporting portable ladder, nonadjustable in length, consisting of two sections hinged at the top to form equal angles with the base. The size is designated by the length of the side rails measured along the front edge.

(29) Unprotected sides and edges means any side or edge (except at entrances to points of access) of a stairway where there is no stairrail system or wall 36 inches (.9 m) or more in height, and any side or edge (except at entrances to points of access) of a stairway landing, or ladder platform where there is no wall or guardrail system 39 inches (1 m) or more in height.

[Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-47501, filed 11/22/91, effective 12/24/91.]

WAC 296-155-476 General requirements. (1) A stairway or ladder shall be provided at all personnel points of access where there is a break in elevation of 19 inches (48 cm) or more, and no ramp, runway, sloped embankment, or personnel hoist is provided.

(a) Employees shall not use any spiral stairways that will not be a permanent part of the structure on which construction work is being performed.

(b) A double-cleated ladder or two or more separate ladders shall be provided when ladders are the only mean of access or exit from a working area for 25 or more employees, or when a ladder is to serve simultaneous two-way traffic.

(c) When a building or structure has only one point of access between levels, that point of access shall be kept clear to permit free passage of employees. When work must be performed or equipment must be used such that free passage at that point of access is restricted, a second point of access shall be provided and used.

(d) When a building or structure has two or more points of access between levels, at least one point of access shall be kept clear to permit free passage of employees.

(2) Employers shall provide and install all stairway and ladder fall protection systems required by this part and shall comply with all other pertinent requirements of this part before employees begin the work that necessitates the installation and use of stairways, ladders, and their respective fall protection systems.

[Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-476, filed 11/22/91, effective 12/24/91.]

WAC 296-155-477 Stairways. (1) General. The following requirements apply to all stairways as indicated:

(1999 Ed.)

(a) Stairways that will not be a permanent part of the structure on which construction work is being performed shall have landings of not less than 30 inches (76 cm) in the direction of travel and extend at least 22 inches (56 cm) in width at every 12 feet (3.7 m) or less of vertical rise.

(b) Stairs shall be installed between 30 deg. and 50 deg. from horizontal.

(c) In all buildings or structures two or more stories or twenty-four feet or more in height or depth, suitable permanent or temporary stairways shall be installed.

(d) Stairways, ramps or ladders shall be provided at all points where a break in elevation of eighteen inches or more occurs in a frequently traveled passageway, entry or exit.

(e) A minimum of one stairway shall be provided for access and exit for buildings and structures to three stories or thirty-six feet; if more than three stories or thirty-six feet, two or more stairways shall be provided. Where two stairways are provided and work is being performed in the stairways, one shall be maintained clear for access between levels at all times.

(f) Wood frame buildings.

(i) The stairway to a second or higher floor shall be completed before studs are raised to support the next higher floor.

(ii) Roof and attic work areas of all buildings shall be provided with a safe means of access and egress, such as stairways, ramps or ladders.

(iii) Cleats shall not be nailed to studs to provide access to and egress from roof or other work areas.

(g) Steel frame buildings. Stairways shall extend to the uppermost floor that has been planked or decked. Ladders may be used above that point.

(h) Reinforced concrete or composite steel—Concrete buildings. Stairways shall extend to the lowermost floor upon which a complete vertical shoring system is in place. A minimum of two ladders at different locations for each floor may be used above this floor but not to exceed three floors.

(i) Riser height and tread depth shall be uniform within each flight of stairs, including any foundation structure used as one or more treads of the stairs. Variations in riser height or tread depth shall not be over 1/4-inch (0.6 cm) in any stairway system.

(j) Where doors or gates open directly on a stairway, a platform shall be provided, and the swing of the door shall not reduce the effective width of the platform to less than 20 inches (51 cm).

(k) Metal pan landings and metal pan treads, when used, shall be secured in place before filling with concrete or other material.

(l) All parts of stairways shall be free of hazardous projections, such as protruding nails.

(m) Slippery conditions on stairways shall be eliminated before the stairways are used to reach other levels.

(n) Employers are permitted to use alternating tread type stairs as long as they install, use, and maintain the stairs in accordance with manufacturer's recommendations and the following:

(i) The stair must be installed at an angle of seventy degrees or less.

(ii) The stair must be capable of withstanding a minimum uniform load of one hundred pounds per square foot

with a design factor of 1.7, and the treads must be capable of carrying a minimum concentrated load of three hundred pounds at the center of any treadspan or exterior arc with a design factor of 1.7. If the stair is intended for greater loading, construction must allow for that loading.

(iii) The stair must be equipped with a handrail on each side to assist the user in climbing or descending.

(o) Due to space limitations, when a permanent stairway must be installed at an angle above fifty degrees, such an installation (commonly called an inclined or ship's ladder) shall have treads, open risers and handrails on both sides.

(p) Where ladders are permitted for access under subsection (1) of this section, means shall be provided for employee hoisting of tools and material, such as a well wheel and hoisting line or the equivalent, so employees will have both hands free for ascending and descending ladders.

(2) Temporary service. The following requirements apply to all stairways as indicated:

(a) Except during stairway construction, foot traffic is prohibited on stairways with pan stairs where the treads and/or landings are to be filled in with concrete or other material at a later date, unless the stairs are temporarily fitted with wood or other solid material at least to the top edge of each pan. Such temporary treads and landings shall be replaced when worn below the level of the top edge of the pan.

(b) Except during stairway construction, foot traffic is prohibited on skeleton metal stairs where permanent treads and/or landings are to be installed at a later date, unless the stairs are fitted with secured temporary treads and landings long enough to cover the entire tread and/or landing area.

(c) Treads for temporary service shall be made of wood or other solid material, and shall be installed the full width and depth of the stair.

(3) Stairrails and handrails. The following requirements apply to all stairways as indicated:

(a) Stairways having four or more risers or rising more than 30 inches (76 cm), whichever is less, shall be equipped with:

- (i) At least one handrail; and
- (ii) One stairrail system along each unprotected side or edge.

Note: When the top edge of a stairrail system also serves as a handrail, subdivision (g) of this subsection applies.

(b) Winding and spiral stairways shall be equipped with a handrail offset sufficiently to prevent walking on those portions of the stairways where the tread width is less than 6 inches (15 cm).

(c) The height of stairrails shall be as follows:

(i) Stairrails installed after the effective date of this standard, shall be not less than 36 inches (91.5 cm) from the upper surface of the stairrail system to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

(ii) Stairrails installed before the effective date of this standard, shall be not less than 30 inches (76 cm) nor more than 34 inches (86 cm) from the upper surface of the stairrail system to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

(d) Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members, shall be provided between the top rail of the stairrail system and the stairway steps.

(i) Midrails, when used, shall be located at a height midway between the top edge of the stairrail system and the stairway steps.

(ii) Screens or mesh, when used, shall extend from the top rail to the stairway step, and along the entire opening between top rail supports.

(iii) When intermediate vertical members, such as balusters, are used between posts, they shall be not more than 19 inches (48 cm) apart.

(iv) Other structural members, when used, shall be installed such that there are no openings in the stairrail system that are more than 19 inches (48 cm) wide.

(e) Handrails and the top rails of stairrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds (890 n) applied within 2 inches (5 cm) of the top edge, in any downward or outward direction, at any point along the top edge.

(f) The height of handrails shall be not more than 37 inches (94 cm) nor less than 30 inches (76 cm) from the upper surface of the handrail to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

(g) When the top edge of a stairrail system also serves as a handrail, the height of the top edge shall be not more than 37 inches (94 cm) nor less than 36 inches (91.5 cm) from the upper surface of the stairrail system to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

(h) Stairrail systems and handrails shall be so surfaced as to prevent injury to employees from punctures or lacerations, and to prevent snagging of clothing.

(i) Handrails shall provide an adequate handhold for employees grasping them to avoid falling.

(j) The ends of stairrail systems and handrails shall be constructed so as not to constitute a projection hazard.

(k) Handrails that will not be a permanent part of the structure being built shall have a minimum clearance of 3 inches (8 cm) between the handrail and walls, stairrail systems, and other objects.

(l) Unprotected sides and edges of stairway landings shall be provided with guardrail systems. Guardrail system criteria are contained in chapter 296-155 WAC, Part K.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-24-051, § 296-155-477, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW, 95-10-016, § 296-155-477, filed 4/25/95, effective 10/1/95; 91-24-017 (Order 91-07), § 296-155-477, filed 11/22/91, effective 12/24/91.]

WAC 296-155-480 Ladders. (1) General. The following requirements apply to all ladders as indicated, including job-made ladders.

(a) Ladders shall be capable of supporting the following loads without failure:

(i) Each self-supporting portable ladder: At least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladder shall sustain at least 3.3 times the maximum intended load. The ability of a ladder to sustain the loads indicated in this section shall be

determined by applying or transmitting the requisite load to the ladder in a downward vertical direction. Ladders built and tested in conformance with the applicable provisions of appendix A of this part will be deemed to meet this requirement.

(ii) Each portable ladder that is not self-supporting: At least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladders shall sustain at least 3.3 times the maximum intended load. The ability of a ladder to sustain the loads indicated in this section shall be determined by applying or transmitting the requisite load to the ladder in a downward vertical direction when the ladder is placed at an angle of 75 1/2 degrees from the horizontal. Ladders built and tested in conformance with the applicable provisions of appendix A will be deemed to meet this requirement.

(iii) Each fixed ladder: At least two loads of 250 pounds (114 kg) each, concentrated between any two consecutive attachments (the number and position of additional concentrated loads of 250 pounds (114 kg) each, determined from anticipated usage of the ladder, shall also be included), plus anticipated loads caused by ice buildup, winds, rigging, and impact loads resulting from the use of ladder safety devices. Each step or rung shall be capable of supporting a single concentrated load of at least 250 pounds (114 kg) applied in the middle of the step or rung. Ladders built in conformance with the applicable provisions of appendix A will be deemed to meet this requirement.

(b) Ladder rungs, cleats, and steps shall be parallel, level, and uniformly spaced when the ladder is in position for use.

(c)(i) Rungs, cleats, and steps of portable ladders (except as provided below) and fixed ladders (including individual-rung/step ladders) shall be spaced not less than 10 inches (25 cm) apart, nor more than 14 inches (36 cm) apart, as measured between centerlines of the rungs, cleats, and steps.

(ii) Rungs, cleats, and steps of step stools shall be not less than 8 inches (20 cm) apart, nor more than 12 inches (31 cm) apart, as measured between centerlines of the rungs, cleats, and steps.

(iii) Rungs, cleats, and steps of the base section of extension trestle ladders shall be not less than 8 inches (20 cm) nor more than 18 inches (46 cm) apart, as measured between centerlines of the rungs, cleats, and steps. The rung spacing on the extension section of the extension trestle ladder shall be not less than 6 inches (15 cm) nor more than 12 inches (31 cm), as measured between centerlines of the rungs, cleats, and steps.

(iv) Cleats on job-made ladders shall be inset into the edges of the side-rails one-half inch, or filler blocks shall be used on the side-rails between the cleats.

(v) Cleats on job-made ladders shall be secured to each rail with three 10d common wire nails or other fasteners of equivalent strength.

(d)(i) The minimum clear distance between the sides of individual-rung/step ladders and the minimum clear distance between the side rails of other fixed ladders shall be 16 inches (41 cm).

(ii) The minimum clear distance between side rails for all portable ladders shall be 11 1/2 inches (29 cm).

(e) The rungs of individual-rung/step ladders shall be shaped such that employees' feet cannot slide off the end of the rungs.

(f)(i) The rungs and steps of fixed metal ladders manufactured after the effective date of this standard, shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.

(ii) The rungs and steps of portable metal ladders shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.

(g) Ladders shall not be tied or fastened together to provide longer sections unless they are specifically designed for such use.

(h) A metal spreader or locking device shall be provided on each stepladder to hold the front and back sections in an open position when the ladder is being used.

(i) When splicing is required to obtain a given length of side rail, the resulting side rail must be at least equivalent in strength to a one-piece side rail made of the same material.

(j) Except when portable ladders are used to gain access to fixed ladders (such as those on utility towers, billboards, and other structures where the bottom of the fixed ladder is elevated to limit access), when two or more separate ladders are used to reach an elevated work area, the ladders shall be offset with a platform or landing between the ladders. (The requirements to have guardrail systems with toeboards for falling object and overhead protection on platforms and landings are set forth in chapter 296-155 WAC, Part K.)

(k) Ladder components shall be surfaced so as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.

(l) Wood ladders shall not be coated with any opaque covering, except for identification or warning labels which may be placed on one face only of a side rail.

(m) The minimum perpendicular clearance between fixed ladder rungs, cleats, and steps, and any obstruction behind the ladder shall be 7 inches (18 cm), except in the case of an elevator pit ladder, for which a minimum perpendicular clearance of 4 1/2 inches (11 cm) is required.

(n) The minimum perpendicular clearance between the center line of fixed ladder rungs, cleats, and steps, and any obstruction on the climbing side of the ladder shall be 30 inches (76 cm), except as provided in (o) of this subsection.

(o) When unavoidable obstructions are encountered, the minimum perpendicular clearance between the centerline of fixed ladder rungs, cleats, and steps, and the obstruction on the climbing side of the ladder may be reduced to 24 inches (61 cm), provided that a deflection device is installed to guide employees around the obstruction.

(p) Through fixed ladders at their point of access/egress shall have a step-across distance of not less than 7 inches (18 cm) nor more than 12 inches (30 cm) as measured from the centerline of the steps or rungs to the nearest edge of the landing area. If the normal step-across distance exceeds 12 inches (30 cm), a landing platform shall be provided to reduce the distance to the specified limit.

(q) Fixed ladders without cages or wells shall have a clear width to the nearest permanent object of at least 15 inches (38 cm) on each side of the centerline of the ladder.

(r) Fixed ladders shall be provided with cages, wells, ladder safety devices, or self-retracting lifelines where the length of climb is less than 24 feet (7.3 m) but the top of the ladder is at a distance greater than 24 feet (7.3 m) above lower levels.

(s) Where the total length of a climb equals or exceeds 24 feet (7.3 m), fixed ladders shall be equipped with one of the following:

(i) Ladder safety devices; or

(ii) Self-retracting lifelines, and rest platforms at intervals not to exceed 150 feet (45.7 m); or

(iii) A cage or well, and multiple ladder sections, each ladder section not to exceed 50 feet (15.2 m) in length. Ladder sections shall be offset from adjacent sections, and landing platforms shall be provided at maximum intervals of 50 feet (15.2 m).

(t) Cages for fixed ladders shall conform to all of the following:

(i) Horizontal bands shall be fastened to the side rails of rail ladders, or directly to the structure, building, or equipment for individual-rung ladders;

(ii) Vertical bars shall be on the inside of the horizontal bands and shall be fastened to them;

(iii) Cages shall extend not less than 27 inches (68 cm), or more than 30 inches (76 cm) from the centerline of the step or rung (excluding the flare at the bottom of the cage), and shall not be less than 27 inches (68 cm) in width;

(iv) The inside of the cage shall be clear of projections;

(v) Horizontal bands shall be spaced not more than 4 feet (1.2 m) on center vertically;

(vi) Vertical bars shall be spaced at intervals not more than 9 1/2 inches (24 cm) on center horizontally;

(vii) The bottom of the cage shall be at a level not less than 7 feet (2.1 m) nor more than 8 feet (2.4 m) above the point of access to the bottom of the ladder. The bottom of the cage shall be flared not less than 4 inches (10 cm) all around within the distance between the bottom horizontal band and the next higher band;

(viii) The top of the cage shall be a minimum of 42 inches (1.1 m) above the top of the platform, or the point of access at the top of the ladder, with provision for access to the platform or other point of access.

(u) Wells for fixed ladders shall conform to all of the following:

(i) They shall completely encircle the ladder;

(ii) They shall be free of projections;

(iii) Their inside face on the climbing side of the ladder shall extend not less than 27 inches (68 cm) nor more than 30 inches (76 cm) from the centerline of the step or rung;

(iv) The inside clear width shall be at least 30 inches (76 cm);

(v) The bottom of the wall on the access side shall start at a level not less than 7 feet (2.1 m) nor more than 8 feet (2.4 m) above the point of access to the bottom of the ladder.

(v) Ladder safety devices, and related support systems, for fixed ladders shall conform to all of the following:

(i) They shall be capable of withstanding without failure a drop test consisting of an 18-inch (41 cm) drop of a 500-pound (226 kg) weight;

(ii) They shall permit the employee using the device to ascend or descend without continually having to hold, push or pull any part of the device, leaving both hands free for climbing;

(iii) They shall be activated within 2 feet (.61 m) after a fall occurs, and limit the descending velocity of an employee to 7 feet/sec. (2.1 m/sec.) or less;

(iv) The connection between the carrier or lifeline and the point of attachment to the body belt or harness shall not exceed 9 inches (23 cm) in length.

(w) The mounting of ladder safety devices for fixed ladders shall conform to the following:

(i) Mountings for rigid carriers shall be attached at each end of the carrier, with intermediate mountings, as necessary, spaced along the entire length of the carrier, to provide the strength necessary to stop employees' falls.

(ii) Mountings for flexible carriers shall be attached at each end of the carrier. When the system is exposed to wind, cable guides for flexible carriers shall be installed at a minimum spacing of 25 feet (7.6 m) and maximum spacing of 40 feet (12.2 m) along the entire length of the carrier, to prevent wind damage to the system.

(iii) The design and installation of mountings and cable guides shall not reduce the design strength of the ladder.

(x) The side rails of through or side-step fixed ladders shall extend 42 inches (1.1 m) above the top of the access level or landing platform served by the ladder. For a parapet ladder, the access level shall be the roof if the parapet is cut to permit passage through the parapet; if the parapet is continuous, the access level shall be the top of the parapet.

(y) For through-fixed-ladder extensions, the steps or rungs shall be omitted from the extension and the extension of the side rails shall be flared to provide not less than 24 inches (61 cm) nor more than 30 inches (76 cm) clearance between side rails. Where ladder safety devices are provided, the maximum clearance between side rails of the extensions shall not exceed 36 inches (91 cm).

(z) For side-step fixed ladders, the side rails and the steps or rungs shall be continuous in the extension.

(aa) Individual-rung/step ladders, except those used where their access openings are covered with manhole covers or hatches, shall extend at least 42 inches (1.1 m) above an access level or landing platform either by the continuation of the rung spacings as horizontal grab bars or by providing vertical grab bars that shall have the same lateral spacing as the vertical legs of the rungs.

(2) Use. The following requirements apply to the use of all ladders, including job-made ladders, except as otherwise indicated:

(a) When portable ladders are used for access to an upper landing surface, the ladder side rails shall extend at least 3 feet (.9 m) above the upper landing surface to which the ladder is used to gain access; or, when such an extension is not possible because of the ladder's length, then the ladder shall be secured at its top to a rigid support that will not deflect, and a grasping device, such as a grabrail, shall be provided to assist employees in mounting and dismounting the ladder. In no case shall the extension be such that ladder deflection under a load would, by itself, cause the ladder to slip off its support.

(b) Ladders shall be maintained free of oil, grease, and other slipping hazards.

(c) Ladders shall not be loaded beyond the maximum intended load for which they were built, nor beyond their manufacturer's rated capacity.

(d) Ladders shall be used only for the purpose for which they were designed.

(e)(i) Nonself-supporting ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support).

(ii) Wood job-made ladders with spliced side rails shall be used at an angle such that the horizontal distance is one-eighth the working length of the ladder.

(iii) Fixed ladders shall be used at a pitch no greater than 90 degrees from the horizontal, as measured to the back side of the ladder.

(f) Ladders shall be used only on stable and level surfaces unless secured to prevent accidental displacement.

(g) Ladders shall not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental displacement. Slip-resistant feet shall not be used as a substitute for care in placing, lashing, or holding a ladder that is used upon slippery surfaces including, but not limited to, flat metal or concrete surfaces that are constructed so they cannot be prevented from becoming slippery.

(h) Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways, shall be secured to prevent accidental displacement, or a barricade shall be used to keep the activities or traffic away from the ladder.

(i) The area around the top and bottom of ladders shall be kept clear.

(j) The top of a nonself-supporting ladder shall be placed with the two rails supported equally unless it is equipped with a single support attachment.

(k) Ladders shall not be moved, shifted, or extended while occupied.

(l) Ladders shall have nonconductive side rails if they are used where the employee or the ladder could contact exposed energized electrical equipment, except as provided in the following:

(i) Portable metal or other portable conductive ladders shall not be used on or near energized line or equipment except where nonconductive ladders present a greater electrical hazard than conductive ladders. A greater electrical hazard would be static electricity such as might be found in extra high voltage substations.

(ii) All conductive or metal ladders shall be prominently marked and identified as being conductive.

(iii) All conductive or metal ladders shall be grounded when used near energized lines or equipment.

(m) The top or top step of a stepladder shall not be used as a step.

(n) Cross-bracing on the rear section of stepladders shall not be used for climbing unless the ladders are designed and provided with steps for climbing on both front and rear sections.

(o) Ladders shall be inspected by a competent person for visible defects on a periodic basis and after any occurrence that could affect their safe use.

(p) Portable ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, corroded components, or other faulty or defective components, shall either be immediately marked in a manner that readily identifies them as defective, or be tagged with "do not use" or similar language, and shall be withdrawn from service until repaired.

(q) Fixed ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, or corroded components, shall be withdrawn from service until repaired. The requirement to withdraw a defective ladder from service is satisfied if the ladder is either:

(i) Immediately tagged with "do not use" or similar language;

(ii) Marked in a manner that readily identifies it as defective;

(iii) Or blocked (such as with a plywood attachment that spans several rungs).

(r) Ladder repairs shall restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.

(s) Single-rail ladders shall not be used.

(t) When ascending or descending a ladder, the user shall face the ladder.

(u) Employees shall not ascend or descend ladders while carrying tools or materials that might interfere with the free use of both hands.

(v) When working from a ladder, the ladder shall be secured at both top and bottom.

(w) No type of work shall be performed on a ladder over twenty-five feet from the ground or floor that requires the use of both hands to perform the work, unless a safety belt is worn and the safety lanyard is secured to the ladder.

(x) Any work that requires wearing eye protection, respirators, or handling of pressure equipment shall not be performed from a ladder more than twenty-five feet above the surrounding surface.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-480, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-480, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-480, filed 7/20/94, effective 9/20/94; 91-24-017 (Order 91-07), § 296-155-480, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-480, filed 1/10/91, effective 2/12/91; 90-09-026 (Order 90-01), § 296-155-480, filed 4/10/90, effective 5/25/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-480, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.150, and 49.17.240. 79-08-115 (Order 79-9), § 296-155-480, filed 7/31/79; Order 76-29, § 296-155-480, filed 9/30/76; Order 76-6, § 296-155-480, filed 3/1/76; Order 74-26, § 296-155-480, filed 5/7/74, effective 6/6/74.]

WAC 296-155-48060 Training requirements. The following training provisions clarify the requirements of WAC 296-155-100 (1)(c), regarding the hazards addressed in chapter 296-155 WAC, Part J.

(1)(a) The employer shall provide a training program for each employee using ladders and stairways. The program shall enable each employee to recognize hazards related to ladders and stairways, and shall train each employee in the procedures to be followed to minimize these hazards.

(b) The employer shall ensure that each employee has been trained by a competent person in the following areas, as applicable:

- (i) The nature of fall hazards in the work area;
 - (ii) The correct procedures for erecting, maintaining, and disassembling the fall protection systems to be used;
 - (iii) The proper construction, use, placement, and care in handling of all stairways and ladders;
 - (iv) The maximum intended load-carrying capacities of ladders used; and
 - (v) The standards contained in this part.
- (2) Retraining shall be provided for each employee as necessary so that the employee maintains the understanding and knowledge acquired through compliance with this section.

[Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-48060, filed 11/22/91, effective 12/24/91.]

WAC 296-155-48080 Appendix A. This appendix serves as a nonmandatory guideline to assist employers in complying with the ladder loading and strength requirements of WAC 296-155-480 (1)(a). A ladder designed and built in accordance with the applicable national consensus standards, as set forth below, will be considered to meet the requirements of WAC 296-155-480 (1)(a):

** Manufactured portable wood ladders: American National Standards Institute (ANSI) A14.1-1982—American National Standard for Ladders-Portable Wood-Safety Requirements.

** Manufactured portable metal ladders: ANSI A14.2-1982—American National Standard for Ladders—Portable Metal-Safety Requirements.

** Manufactured fixed ladders: ANSI A14.3-1984—American National Standard for Ladders-Fixed-Safety Requirements.

** Job-made ladders: ANSI A14.4-1979—Safety Requirements for Job-Made Ladders.

** Plastic ladders: ANSI A14.5-1982—American National Standard for Ladders-Portable Reinforced Plastic-Safety Requirements.

[Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-48080, filed 11/22/91, effective 12/24/91.]

WAC 296-155-48090 Reserved.

[Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-48090, filed 11/22/91, effective 12/24/91; Order 76-29, Table J-18 (codified as WAC 296-155-48090), filed 9/30/76; Order 76-6, Table J-18, filed 3/1/76. Formerly 296-155-480 (part).]

PART J-1 SCAFFOLDS

WAC 296-155-481 Scope and application. This part applies to all scaffolds used in workplaces covered by this chapter. It does not apply to crane or derrick suspended personnel platforms, which are covered by chapter 296-155 WAC, Part L. The criteria for manually propelled elevating work platforms are set out exclusively in WAC 296-155-487.

The criteria for self-propelled elevating work platforms are set out exclusively in WAC 296-155-488.

The criteria for boom supported elevating work platforms are set out exclusively in WAC 296-155-489.

[Title 296 WAC—p. 2232]

The criteria for aerial lifts are set out exclusively in WAC 296-155-490.

Additional requirements for forklift supported personnel platforms are set out in WAC 296-155-615 (3)(h).

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060, 98-05-046, § 296-155-481, filed 2/13/98, effective 4/15/98. Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-481, filed 11/22/91, effective 12/24/91.]

WAC 296-155-482 Definitions applicable to this part.

"Adjustable suspension scaffold" means a suspension scaffold equipped with a hoist(s) that can be operated by an employee(s) on the scaffold.

"Bearer (putlog)" means a horizontal transverse scaffold member (which may be supported by ledgers or runners) upon which the scaffold platform rests and which joins scaffold uprights, posts, poles, and similar members.

"Boatswains' chair" means a single-point adjustable suspension scaffold consisting of a seat or sling designed to support one employee in a sitting position.

"Body belt (safety belt)" means a strap with means both for securing it about the waist and for attaching it to a lanyard or lifeline, used only in fall restraint or positioning device systems. A body belt may not be used for fall arrest.

"Body harness" means a design of straps which may be secured about the employee in a manner to distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders, with means for attaching it to other components of a personal fall arrest system.

"Brace" means a rigid connection that holds one scaffold member in a fixed position with respect to another member, or to a building or structure.

"Bricklayers' square scaffold" means a supported scaffold composed of framed squares which support a platform.

"Carpenters' bracket scaffold" means a supported scaffold consisting of a platform supported by brackets attached to building or structural walls.

"Catenary scaffold" means a suspension scaffold consisting of a platform supported by two essentially horizontal and parallel ropes attached to structural members of a building or other structure. Additional support may be provided by vertical pickups.

"Chimney hoist" means a multipoint adjustable suspension scaffold used to provide access to work inside chimneys. (See "multipoint adjustable suspension scaffold.")

"Cleat" means a structural block used at the end of a platform to prevent the platform from slipping off its supports. Cleats are also used to provide footing on sloped surfaces such as crawling boards.

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

"Continuous run scaffold (run scaffold)" means a two-point or multipoint adjustable suspension scaffold constructed using a series of interconnected braced scaffold members or supporting structures erected to form a continuous scaffold.

"Coupler" means a device for locking together the tubes of a tube and coupler scaffold.

"Crawling board (chicken ladder)" means a supported scaffold consisting of a plank with cleats spaced and secured to provide footing, for use on sloped surfaces such as roofs.

"Deceleration device" means any mechanism, such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing or deforming lanyard, or automatic self-retracting lifeline lanyard, which dissipates a substantial amount of energy during a fall arrest or limits the energy imposed on an employee during fall arrest.

"Double pole (independent pole) scaffold" means a supported scaffold consisting of a platform(s) resting on cross beams (bearers) supported by ledgers and a double row of uprights independent of support (except ties, guys, braces) from any structure.

"Equivalent" means alternative designs, materials or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.

"Exposed power lines" means electrical power lines which are accessible to employees and which are not shielded from contact. Such lines do not include extension cords or power tool cords.

"Eye or eye splice" means a loop with or without a thimble at the end of a wire rope.

"Fabricated decking and planking" means manufactured platforms made of wood (including laminated wood, and solid sawn wood planks), metal or other materials.

"Fabricated frame scaffold (tubular welded frame scaffold)" means a scaffold consisting of a platform(s) supported on fabricated end frames with integral posts, horizontal bearers, and intermediate members.

"Failure" means load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

"Falling object protection" means those devices, systems, structures, work practices or other means intended to prevent tools, materials, debris and other objects from falling or to deflect or contain falling objects in order to prevent them striking workers below.

"Float (ship) scaffold" means a suspension scaffold consisting of a braced platform resting on two parallel bearers and hung from overhead supports by ropes of fixed length.

"Form scaffold" means a supported scaffold consisting of a platform supported by brackets attached to formwork.

"Guardrail system" means a vertical barrier, consisting of, but not limited to, top rails, midrails, and posts, erected to prevent employees from falling off a scaffold platform or walkway to lower levels.

"Hoist" means a manual or power-operated mechanical device to raise or lower a suspended scaffold.

"Horse scaffold" means a supported scaffold consisting of a platform supported by construction horses (saw horses). Horse scaffolds constructed of metal are sometimes known as trestle scaffolds.

"Independent pole scaffold" (see "double pole scaffold").

"Interior hung scaffold" means a suspension scaffold consisting of a platform suspended from the ceiling or roof structure by fixed length supports.

"Ladder jack scaffold" means a supported scaffold consisting of a platform resting on brackets attached to ladders.

"Ladder stand" means a mobile, fixed-size, self-supporting ladder consisting of a wide flat tread ladder in the form of stairs.

"Landing" means a platform at the end of a flight of stairs.

"Large area scaffold" means a pole scaffold, tube and coupler scaffold, systems scaffold, or fabricated frame scaffold erected over substantially the entire work area. For example: A scaffold erected over the entire floor area of a room.

"Lean-to scaffold" means a supported scaffold which is kept erect by tilting it toward and resting it against a building or structure.

"Ledger" - see runner.

"Lifeline" means a component consisting of a flexible line that connects to an anchorage at one end to hang vertically (vertical lifeline), or that connects to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

"Lower levels" means areas below the level where the employee is located and to which an employee can fall. Such areas include, but are not limited to, ground levels, floors, roofs, ramps, runways, excavations, pits, tanks, materials, water, and equipment.

"Masons' adjustable supported scaffold" (see "self-contained adjustable scaffold").

"Masons' multipoint adjustable suspension scaffold" means a continuous run suspension scaffold designed and used for masonry operations.

"Maximum intended load" means the total load of all persons, equipment, tools, materials, transmitted loads, and other loads reasonably anticipated to be applied to a scaffold or scaffold component at any one time.

"Mobile scaffold" means a powered or unpowered, portable, caster or wheel-mounted supported scaffold.

"Multilevel suspended scaffold" means a two-point or multipoint adjustable suspension scaffold with a series of platforms at various levels resting on common stirrups.

"Multipoint adjustable suspension scaffold" means a suspension scaffold consisting of a platform(s) which is suspended by more than two ropes from overhead supports and equipped with means to raise and lower the platform to desired work levels. Such scaffolds include chimney hoists.

"Needle beam scaffold" means a platform suspended from needle beams.

"Open sides and ends" means the edges of a platform that are more than 14 inches (36 cm) away horizontally from a sturdy, continuous, vertical surface (such as a building wall) or a sturdy, continuous horizontal surface (such as a floor), or a point of access. Exception: For plastering and lathing operations the horizontal threshold distance is 18 inches (46 cm).

"Outrigger" means the structural member of a supported scaffold used to increase the base width of a scaffold in order to provide support for and increased stability of the scaffold.

"Outrigger beam (thrustout)" means the structural member of a suspension scaffold or outrigger scaffold which provides support for the scaffold by extending the scaffold point of attachment to a point out and away from the structure or building.

"Outrigger scaffold" means a supported scaffold consisting of a platform resting on outrigger beams (thrustouts) projecting beyond the wall or face of the building or structure, the inboard ends of which are secured inside the building or structure.

"Overhand bricklaying" means the process of laying bricks and masonry units such that the surface of the wall to be jointed is on the opposite side of the wall from the mason, requiring the mason to lean over the wall to complete the work. It includes mason tending and electrical installation incorporated into the brick wall during the overhand bricklaying process.

"Personal fall arrest system" means a system used to arrest an employee's fall. It consists of an anchorage, connectors, and body harness and may also include a lanyard, deceleration device, lifeline, or combinations of these.

"Platform" means a work surface elevated above lower levels. Platforms can be constructed using individual wood planks, fabricated planks, fabricated decks, and fabricated platforms.

"Pole scaffold" (see definitions for "single-pole scaffold" and "double (independent) pole scaffold").

"Power operated hoist" means a hoist which is powered by other than human energy.

"Pump jack scaffold" means a supported scaffold consisting of a platform supported by vertical poles and movable support brackets.

"Putlog" - see bearer.

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

"Rated load" means the manufacturer's specified maximum load to be lifted by a hoist or to be applied to a scaffold or scaffold component.

"Repair bracket scaffold" means a supported scaffold consisting of a platform supported by brackets which are secured in place around the circumference or perimeter of a chimney, stack, tank or other supporting structure by one or more wire ropes placed around the supporting structure.

"Ribbon" - see runner.

"Roof bracket scaffold" means a rooftop supported scaffold consisting of a platform resting on angular-shaped supports.

"Runner (ledger or ribbon)" means the lengthwise horizontal spacing or bracing member which may support the bearers.

"Scaffold" means any temporary elevated platform (supported or suspended) and its supporting structure (includ-

ing points of anchorage), used for supporting employees or materials or both.

"Self-contained adjustable scaffold" means a combination supported and suspension scaffold consisting of an adjustable platform(s) mounted on an independent supporting frame(s) not a part of the object being worked on, and which is equipped with a means to permit the raising and lowering of the platform(s). Such systems include rolling roof rigs, rolling outrigger systems, and some masons' adjustable supported scaffolds.

"Shore scaffold" means a supported scaffold which is placed against a building or structure and held in place with props.

"Single-point adjustable suspension scaffold" means a suspension scaffold consisting of a platform suspended by one rope from an overhead support and equipped with means to permit the movement of the platform to desired work levels.

"Single-pole scaffold" means a supported scaffold consisting of a platform(s) resting on bearers, the outside ends of which are supported on runners secured to a single row of posts or uprights, and the inner ends of which are supported on or in a structure or building wall.

"Stair tower (scaffold stairway/tower)" means a tower comprised of scaffold components and which contains internal stairway units and rest platforms. These towers are used to provide access to scaffold platforms and other elevated points such as floors and roofs.

"Stall load" means the load at which the prime-mover of a power-operated hoist stalls or the power to the prime-mover is automatically disconnected.

"Step, platform, and trestle ladder scaffold" means a platform resting directly on the rungs of step ladders or trestle ladders.

"Stilts" means a pair of poles or similar supports with raised footrests, used to permit walking above the ground or working surface.

"Stonesetters' multipoint adjustable suspension scaffold" means a continuous run suspension scaffold designed and used for stonesetters' operations.

"Supported scaffold" means one or more platforms supported by outrigger beams, brackets, poles, legs, uprights, posts, frames, or similar rigid support.

"Suspension scaffold" means one or more platforms suspended by ropes or other nonrigid means from an overhead structure(s).

"System scaffold" means a scaffold consisting of posts with fixed connection points that accept runners, bearers, and diagonals that can be interconnected at predetermined levels.

"Tank builders' scaffold" means a supported scaffold consisting of a platform resting on brackets that are either directly attached to a cylindrical tank or attached to devices that are attached to such a tank.

"Toeboard" means a barrier installed at the outermost edge of a walking/working surface to prevent objects from falling onto workers below.

"Top plate bracket scaffold" means a scaffold supported by brackets that hook over or are attached to the top of a wall. This type of scaffold is similar to carpenters' bracket

scaffolds and form scaffolds and is used in residential construction for setting trusses.

"Tube and coupler scaffold" means a supported or suspended scaffold consisting of a platform(s) supported by tubing, erected with coupling devices connecting uprights, braces, bearers, and runners.

"Tubular welded frame scaffold" (see "fabricated frame scaffold").

"Two-point suspension scaffold (swing stage)" means a suspension scaffold consisting of a platform supported by hangers (stirrups) suspended by two ropes from overhead supports and equipped with means to permit the raising and lowering of the platform to desired work levels.

"Unstable objects" means items whose strength, configuration, or lack of stability may allow them to become dislocated and shift and therefore may not properly support the loads imposed on them. Unstable objects do not constitute a safe base support for scaffolds, platforms, or employees. Examples include, but are not limited to, barrels, boxes, loose brick, and concrete blocks.

"Vertical pickup" means a rope used to support the horizontal rope in catenary scaffolds.

"Walkway" means a portion of a scaffold platform used only for access and not as a work level.

"Window jack scaffold" means a platform resting on a bracket or jack which projects through a window opening.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-482, filed 2/13/98, effective 4/15/98.]

WAC 296-155-483 General requirements. This section does not apply to manually propelled elevating work platforms, the criteria for which are set out exclusively in WAC 296-155-487.

This section does not apply to self-propelled elevating work platforms, the criteria for which are set out exclusively in WAC 296-155-488.

This section does not apply to boom supported elevating work platforms, the criteria for which are set out exclusively in WAC 296-155-489.

This section does not apply to aerial lifts, the criteria for which are set out exclusively in WAC 296-155-490.

(1) "Capacity"

(a) Except as provided in (b), (c), (d), and (e) of this subsection and subsection (7) of this section, each scaffold and scaffold component shall be capable of supporting, without failure, its own weight and at least 4 times the maximum intended load applied or transmitted to it.

(b) Direct connections to roofs and floors, and counterweights used to balance adjustable suspension scaffolds, shall be capable of resisting at least 4 times the tipping moment imposed by the scaffold operating at the rated load of the hoist, or 1.5 (minimum) times the tipping moment imposed by the scaffold operating at the stall load of the hoist, whichever is greater.

(c) Each suspension rope, including connecting hardware, used on nonadjustable suspension scaffolds shall be capable of supporting, without failure, at least 6 times the maximum intended load applied or transmitted to that rope.

(d) Each suspension rope, including connecting hardware, used on adjustable suspension scaffolds shall be capa-

ble of supporting, without failure, at least 6 times the maximum intended load applied or transmitted to that rope with the scaffold operating at either the rated load of the hoist, or 2 (minimum) times the stall load of the hoist, whichever is greater.

(e) The stall load of any scaffold hoist shall not exceed 3 times its rated load.

(f) Scaffolds shall be designed by a qualified person and shall be constructed and loaded in accordance with that design. Nonmandatory Appendix A to this part contains examples of criteria that will enable an employer to comply with subsection (1) of this section.

(2) "Scaffold platform construction."

(a) Each platform on all working levels of scaffolds shall be fully planked or decked between the front uprights and the guardrail supports as follows:

(i) Each platform unit (e.g., scaffold plank, fabricated plank, fabricated deck, or fabricated platform) shall be installed so that the space between adjacent units and the space between the platform and the uprights is no more than 1 inch (2.5 cm) wide, except where the employer can demonstrate that a wider space is necessary (for example, to fit around uprights when side brackets are used to extend the width of the platform).

(ii) Where the employer makes the demonstration provided for in subsection (2)(a)(i) of this section, the platform shall be planked or decked as fully as possible and the remaining open space between the platform and the uprights shall not exceed 9 1/2 inches (24.1 cm).

Exception to subsection (2)(a) of this section: The requirement in subsection (2)(a) of this section to provide full planking or decking does not apply to platforms used solely as walkways or solely by employees performing scaffold erection or dismantling. In these situations, only the planking necessary to provide safe working conditions is required. Employees on those platforms shall be protected from fall hazards in accordance with subsection (7) of this section.

(b) Except as provided in subsection (2)(b)(i) and (ii) of this section, each scaffold platform and walkway shall be at least 18 inches (46 cm) wide.

(i) Each ladder jack scaffold, top plate bracket scaffold, roof bracket scaffold, and pump jack scaffold shall be at least 12 inches (30 cm) wide. There is no minimum width requirement for boatswains' chairs.

(ii) Where scaffolds must be used in areas that the employer can demonstrate are so narrow that platforms and walkways cannot be at least 18 inches (46 cm) wide, such platforms and walkways shall be as wide as feasible, and employees on those platforms and walkways shall be protected from fall hazards by the use of guardrails and/or personal fall arrest systems.

(c) Except as provided in subsection (2)(c)(i) and (ii) of this section, the front edge of all platforms shall not be more than 14 inches (36 cm) from the face of the work, unless guardrail systems are erected along the front edge and/or personal fall arrest systems are used in accordance with subsection (7) of this section to protect employees from falling.

(i) The maximum distance from the face for outrigger scaffolds shall be 3 inches (8 cm);

(ii) The maximum distance from the face for plastering and lathing operations shall be 18 inches (46 cm).

(d) Each end of a platform, unless cleated or otherwise restrained by hooks or equivalent means, shall extend over the centerline of its support at least 6 inches (15 cm).

(e) Unless the platform is designed and installed so that the cantilevered portion of the platform is able to support employees and/or materials without tipping, or has guardrails which block employee access to the cantilevered end, the end of a platform shall not extend over its support more than:

(i) 12 inches (30 cm) for platforms 10 feet or less in length;

(ii) 18 inches (46 cm) for platforms greater than 10 feet in length.

(f) On scaffolds where scaffold planks are abutted to create a long platform, each abutted end shall rest on a separate support surface. This provision does not preclude the use of common support members, such as "T" sections, to support abutting planks, or hook on platforms designed to rest on common supports.

(g) On scaffolds where platforms are overlapped to create a long platform, the overlap shall occur only over supports, and shall not be less than 12 inches (30 cm) unless the platforms are nailed together or otherwise restrained to prevent movement.

(h) At all points of a scaffold where the platform changes direction, such as turning a corner, any platform that rests on a bearer at an angle other than a right angle shall be laid first, and platforms which rest at right angles over the same bearer shall be laid second, on top of the first platform.

(i) Wood platforms shall not be covered with opaque finishes, except that platform edges may be covered or marked for identification. Platforms may be coated periodically with wood preservatives, fire-retardant finishes, and slip-resistant finishes; however, the coating may not obscure the top or bottom wood surfaces.

(j) Scaffold components shall not be intermixed unless the components fit together without force and the scaffold's structural integrity is maintained by the user. Scaffold components shall not be modified in order to intermix them unless a qualified person determines the resulting scaffold is structurally sound.

(k) Scaffold components made of dissimilar metals shall not be used together unless a competent person has determined that galvanic action will not reduce the strength of any component to a level below that required by subsection (1)(a) of this section.

(3) "Criteria for supported scaffolds."

(a) Supported scaffolds with a height to base width (including outrigger supports, if used) ratio of more than four to one (4:1) shall be restrained from tipping by guying, tying, bracing, or equivalent means, as follows:

(i) Guys, ties, and braces shall be installed at locations where horizontal members support both inner and outer legs.

(ii) Guys, ties, and braces shall be installed according to the scaffold manufacturer's recommendations or at the closest horizontal member to the 4:1 height and be repeated vertically at locations of horizontal members every 20 feet (6.1 m) or less thereafter for scaffolds 3 feet (0.91 m) wide or less, and every 26 feet (7.9 m) or less thereafter for scaffolds

greater than 3 feet (0.91 m) wide. The top guy, tie or brace of completed scaffolds shall be placed no further than the 4:1 height from the top. Such guys, ties and braces shall be installed at each end of the scaffold and at horizontal intervals not to exceed 30 feet (9.1 m) (measured from one end (not both) towards the other).

(b) Ties, guys, braces, or outriggers shall be used to prevent the tipping of supported scaffolds in all circumstances where an eccentric load, such as a cantilevered work platform, is applied or is transmitted to the scaffold.

(c) Supported scaffold poles, legs, posts, frames, and uprights shall bear on base plates resting on adequate firm foundation, such as dry compacted soil, mud sills or concrete slabs.

(i) Footings shall be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement.

(ii) Unstable objects shall not be used to support scaffolds or platform units.

(iii) Unstable objects shall not be used as working platforms.

(iv) Front-end loaders and similar pieces of equipment shall not be used to support scaffold platforms unless they have been specifically designed by the manufacturer for such use.

(v) Fork-lifts shall not be used to support scaffold platforms unless the entire platform is attached to the fork and the fork-lift is not moved horizontally while the platform is occupied.

(d) Supported scaffold poles, legs, posts, frames, and uprights shall be plumb and braced to prevent swaying and displacement.

(4) "Criteria for suspension scaffolds."

(a) All suspension scaffold support devices, such as outrigger beams, cornice hooks, parapet clamps, and similar devices, shall rest on surfaces capable of supporting at least 4 times the load imposed on them by the scaffold operating at the rated load of the hoist (or at least 1.5 times the load imposed on them by the scaffold at the stall capacity of the hoist, whichever is greater).

(b) Suspension scaffold outrigger beams, when used, shall be made of structural metal or equivalent strength material, and shall be restrained to prevent movement.

(c) The inboard ends of suspension scaffold outrigger beams shall be stabilized by bolts or other direct connections to the floor or roof deck, or they shall have their inboard ends stabilized by counterweights, except masons' multipoint adjustable suspension scaffold outrigger beams shall not be stabilized by counterweights.

(i) Before the scaffold is used, direct connections shall be evaluated by a competent person who shall confirm, based on the evaluation, that the supporting surfaces are capable of supporting the loads to be imposed. In addition, masons' multipoint adjustable suspension scaffold connections shall be designed by an engineer experienced in such scaffold design.

(ii) Counterweights shall be made of nonflowable material. Sand, gravel and similar materials that can be easily dislocated shall not be used as counterweights.

(iii) Only those items specifically designed as counterweights shall be used to counterweight scaffold systems.

Construction materials such as, but not limited to, masonry units and rolls of roofing felt, shall not be used as counterweights.

(iv) Counterweights shall be secured by mechanical means to the outrigger beams to prevent accidental displacement.

(v) Counterweights shall not be removed from an outrigger beam until the scaffold is disassembled.

(vi) Outrigger beams which are not stabilized by bolts or other direct connections to the floor or roof deck shall be secured by tiebacks.

(vii) Tiebacks shall be equivalent in strength to the suspension ropes.

(viii) Outrigger beams shall be placed perpendicular to its bearing support (usually the face of the building or structure). However, where the employer can demonstrate that it is not possible to place an outrigger beam perpendicular to the face of the building or structure because of obstructions that cannot be moved, the outrigger beam may be placed at some other angle, provided opposing angle tiebacks are used.

(ix) Tiebacks shall be secured to a structurally sound anchorage on the building or structure. Sound anchorages include structural members, but do not include standpipes, vents, other piping systems, or electrical conduit.

(x) Tiebacks shall be installed perpendicular to the face of the building or structure, or opposing angle tiebacks shall be installed. Single tiebacks installed at an angle are prohibited.

(d) Suspension scaffold outrigger beams shall be:

(i) Provided with stop bolts or shackles at both ends;

(ii) Securely fastened together with the flanges turned out when channel iron beams are used in place of I-beams;

(iii) Installed with all bearing supports perpendicular to the beam center line;

(iv) Set and maintained with the web in a vertical position; and

(v) When an outrigger beam is used, the shackle or clevis with which the rope is attached to the outrigger beam shall be placed directly over the center line of the stirrup.

(e) Suspension scaffold support devices such as cornice hooks, roof hooks, roof irons, parapet clamps, or similar devices shall be:

(i) Made of steel, wrought iron, or materials of equivalent strength;

(ii) Supported by bearing blocks; and

(iii) Secured against movement by tiebacks installed at right angles to the face of the building or structure, or opposing angle tiebacks shall be installed and secured to a structurally sound point of anchorage on the building or structure. Sound points of anchorage include structural members, but do not include standpipes, vents, other piping systems, or electrical conduit.

(iv) Tiebacks shall be equivalent in strength to the hoisting rope.

(f) When winding drum hoists are used on a suspension scaffold, they shall contain not less than four wraps of the suspension rope at the lowest point of scaffold travel. When other types of hoists are used, the suspension ropes shall be long enough to allow the scaffold to be lowered to the level below without the rope end passing through the hoist, or the

rope end shall be configured or provided with means to prevent the end from passing through the hoist.

(g) The use of repaired wire rope as suspension rope is prohibited.

(h) Wire suspension ropes shall not be joined together except through the use of eye splice thimbles connected with shackles or coverplates and bolts.

(i) The load end of wire suspension ropes shall be equipped with proper size thimbles and secured by eyesplicing or equivalent means.

(j) Ropes shall be inspected for defects by a competent person prior to each workshift and after every occurrence which could affect a rope's integrity. Ropes shall be replaced if any of the following conditions exist:

(i) Any physical damage which impairs the function and strength of the rope.

(ii) Kinks that might impair the tracking or wrapping of rope around the drum(s) or sheave(s).

(iii) Six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay.

(iv) Abrasion, corrosion, scrubbing, flattening or peening causing loss of more than one-third of the original diameter of the outside wires.

(v) Heat damage caused by a torch or any damage caused by contact with electrical wires.

(vi) Evidence that the secondary brake has been activated during an overspeed condition and has engaged the suspension rope.

(k) Swaged attachments or spliced eyes on wire suspension ropes shall not be used unless they are made by the wire rope manufacturer or a qualified person.

(l) When wire rope clips are used on suspension scaffolds:

(i) There shall be a minimum of 3 wire rope clips installed, with the clips a minimum of 6 rope diameters apart;

(ii) Clips shall be installed according to the manufacturer's recommendations;

(iii) Clips shall be retightened to the manufacturer's recommendations after the initial loading;

(iv) Clips shall be inspected and retightened to the manufacturer's recommendations at the start of each workshift thereafter;

(v) U-bolt clips shall not be used at the point of suspension for any scaffold hoist;

(vi) When U-bolt clips are used, the U-bolt shall be placed over the dead end of the rope, and the saddle shall be placed over the live end of the rope.

(m) Suspension scaffold power-operated hoists and manual hoists shall be tested by a qualified testing laboratory.

(n) Gasoline-powered equipment and hoists shall not be used on suspension scaffolds.

(o) Gears and brakes of power-operated hoists used on suspension scaffolds shall be enclosed.

(p) In addition to the normal operating brake, suspension scaffold power-operated hoists and manually operated hoists shall have a braking device or locking pawl which engages automatically when a hoist makes either of the following uncontrolled movements: An instantaneous change in momentum or an accelerated overspeed.

(q) Manually operated hoists shall require a positive crank force to descend.

(r) Two-point and multipoint suspension scaffolds shall be tied or otherwise secured to prevent them from swaying, as determined to be necessary based on an evaluation by a competent person. Window cleaners' anchors shall not be used for this purpose.

(s) Devices whose sole function is to provide emergency escape and rescue shall not be used as working platforms. This provision does not preclude the use of systems which are designed to function both as suspension scaffolds and emergency systems.

(5) "Access." This paragraph applies to scaffold access for all employees. Access requirements for employees erecting or dismantling supported scaffolds are specifically addressed in (i) of this subsection.

(a) When scaffold platforms are more than 2 feet (0.6 m) above or below a point of access, portable ladders, hook-on ladders, attachable ladders, stair towers (scaffold stairways/towers), stairway-type ladders (such as ladder stands), ramps, walkways, integral prefabricated scaffold access, or direct access from another scaffold, structure, personnel hoist, or similar surface shall be used. Crossbraces shall not be used as a means of access.

(b) Portable, hook-on, and attachable ladders (additional requirements for the proper construction and use of portable ladders are contained in Part J of this chapter — Stairways and ladders):

(i) Portable, hook-on, and attachable ladders shall be positioned so as not to tip the scaffold;

(ii) Hook-on and attachable ladders shall be positioned so that their bottom rung is not more than 24 inches (61 cm) above the scaffold supporting level;

(iii) When hook-on and attachable ladders are used on a supported scaffold more than 24 feet (7.3 m) high, they shall have rest platforms at 20 foot (6.1 m) maximum vertical intervals except the first platform may be up to 24 feet above the ground;

(iv) Hook-on and attachable ladders shall be specifically designed for use with the type of scaffold used;

(v) Hook-on and attachable ladders shall have a minimum rung length of 11 1/2 inches (29 cm); and

(vi) Hook-on and attachable ladders shall have uniformly spaced rungs with a maximum spacing between rungs of 16 3/4 inches.

(c) Stairway-type ladders shall:

(i) Be positioned such that their bottom step is not more than 24 inches (61 cm) above the scaffold supporting level;

(ii) Be provided with rest platforms at 12-foot (3.7 m) maximum vertical intervals;

(iii) Have a minimum step width of 16 inches (41 cm), except that mobile scaffold stairway-type ladders shall have a minimum step width of 11 1/2 inches (30 cm); and

(iv) Have slip-resistant treads on all steps and landings.

(d) Stairtowers (scaffold stairway/towers) shall be positioned such that their bottom step is not more than 24 inches (61 cm) above the scaffold supporting level.

(i) A stairrail consisting of a top rail and a midrail shall be provided on each side of each scaffold stairway.

(ii) The top rail of each stairrail system shall also be capable of serving as a handrail, unless a separate handrail is provided.

(iii) Handrails, and top rails that serve as handrails, shall provide an adequate handhold for employees grasping them to avoid falling.

(iv) Stairrail systems and handrails shall be surfaced to prevent injury to employees from punctures or lacerations, and to prevent snagging of clothing.

(v) The ends of stairrail systems and handrails shall be constructed so that they do not constitute a projection hazard.

(vi) Handrails, and top rails that are used as handrails, shall be at least 3 inches (7.6 cm) from other objects.

(vii) Stairrails shall be not less than 28 inches (71 cm) nor more than 37 inches (94 cm) from the upper surface of the stairrail to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

(viii) A landing platform at least 18 inches (45.7 cm) wide by at least 18 inches (45.7 cm) long shall be provided at each level.

(ix) Each scaffold stairway shall be at least 18 inches (45.7 cm) wide between stairrails.

(x) Treads and landings shall have slip-resistant surfaces.

(xi) Stairways shall be installed between 40 degrees and 60 degrees from the horizontal.

(xii) Guardrails meeting the requirements of subsection (7)(d) of this section shall be provided on the open sides and ends of each landing.

(xiii) Riser height shall be uniform, within 1/4 inch (0.6 cm) for each flight of stairs. Greater variations in riser height are allowed for the top and bottom steps of the entire system, not for each flight of stairs.

(xiv) Tread depth shall be uniform, within 1/4 inch, for each flight of stairs.

(e) Ramps and walkways.

(i) Ramps and walkways 4 feet (1.2 m) or more above lower levels shall have guardrail systems which comply with Part K of this chapter—Floor openings, wall openings and stairways:

(ii) No ramp or walkway shall be inclined more than a slope of one vertical to three horizontal (20 degrees above the horizontal).

(iii) If the slope of a ramp or a walkway is steeper than one vertical in eight horizontal, the ramp or walkway shall have cleats not more than fourteen inches (35 cm) apart which are securely fastened to the planks to provide footing.

(f) Integral prefabricated scaffold access frames shall:

(i) Be specifically designed and constructed for use as ladder rungs;

(ii) Have a rung length of at least 8 inches (20 cm);

(iii) Not be used as work platforms when rungs are less than 11 1/2 inches in length, unless each affected employee uses fall protection, or a positioning device, which complies with WAC 296-155-24510;

(iv) Be uniformly spaced within each frame section;

(v) Be provided with rest platforms at 20-foot (6.1 m) maximum vertical intervals on all supported scaffolds more than 24 feet (7.3 m) high; and

(vi) Have a maximum spacing between rungs of 16 3/4 inches (43 cm). Nonuniform rung spacing caused by joining

end frames together is allowed, provided the resulting spacing does not exceed 16 3/4 inches (43 cm).

(g) Steps and rungs of ladder and stairway type access shall line up vertically with each other between rest platforms.

(h) Direct access to or from another surface shall be used only when the scaffold is not more than 14 inches (36 cm) horizontally and not more than 24 inches (61 cm) vertically from the other surface.

(i) Access for employees erecting or dismantling supported scaffolds shall be in accordance with the following:

(i) The employer shall provide safe means of access for each employee erecting or dismantling a scaffold where the provision of safe access is feasible and does not create a greater hazard. The employer shall have a competent person determine whether it is feasible or would pose a greater hazard to provide, and have employees use a safe means of access. This determination shall be based on site conditions and the type of scaffold being erected or dismantled.

(ii) Hook-on or attachable ladders shall be installed as soon as scaffold erection has progressed to a point that permits safe installation and use.

(iii) When erecting or dismantling tubular welded frame scaffolds, (end) frames, with horizontal members that are parallel, level and are not more than 22 inches apart vertically may be used as climbing devices for access, provided they are erected in a manner that creates a usable ladder and provides good hand hold and foot space.

(iv) Cross braces on tubular welded frame scaffolds shall not be used as a means of access or egress.

(6) "Use."

(a) Scaffolds and scaffold components shall not be loaded in excess of their maximum intended loads or rated capacities, whichever is less.

(b) The use of shore or lean-to scaffolds is prohibited.

(c) Scaffolds and scaffold components shall be inspected for visible defects by a competent person before each work shift, and after any occurrence which could affect a scaffold's structural integrity.

(d) Any part of a scaffold damaged or weakened such that its strength is less than that required by subsection (1)(a) of this section shall be immediately repaired or replaced, braced to meet those provisions, or removed from service until repaired.

(e) Scaffolds shall not be moved horizontally while employees are on them, unless they have been designed by a registered professional engineer specifically for such movement or, for mobile scaffolds, where the provisions of WAC 296-155-484(23) are followed.

(f) The clearance between scaffolds and power lines shall be as follows: Scaffolds shall not be erected, used, dismantled, altered, or moved such that they or any conductive material handled on them might come closer to exposed and energized power lines than as follows:

*Insulated Lines Voltage	Minimum distance	Alternatives
Less than 300 volts.	3 feet (0.9 m)	
*300 volts to 50 kv.	10 feet (3.1 m)	
More than 50 kv.	10 feet (3.1 m) plus 0.4 inches (1.0 cm) for each 1 kv over 50 kv.	2 times the length of the line insulator, but never less than 10 feet (3.1 m).

*Insulated Lines Voltage	Minimum distance	Alternatives
*Uninsulated lines		
Voltage	Minimum distance	Alternatives
Less than 50 kv.	10 feet (3.1 m).	
More than 50 kv.	10 feet (3.1 m) plus 0.4 inches (1.0 cm) for each 1 kv over 50 kv.	2 times the length of the line insulator, but never less than 10 feet (3.1 m).

Exception to subsection (6)(f): Scaffolds and materials may be closer to power lines than specified above where such clearance is necessary for performance of work, and only after the utility company, or electrical system operator, has been notified of the need to work closer and the utility company, or electrical system operator, has deenergized the lines, relocated the lines, or installed protective coverings to prevent accidental contact with the lines.

(g) Scaffolds shall be erected, moved, dismantled, or altered only under the supervision and direction of a competent person qualified in scaffold erection, moving, dismantling or alteration. Such activities shall be performed only by experienced and trained employees selected for such work by the competent person.

(h) Employees shall be prohibited from working on scaffolds covered with snow, ice, or other slippery material except as necessary for removal of such materials.

(i) Where swinging loads are being hoisted onto or near scaffolds such that the loads might contact the scaffold, tag lines or equivalent measures to control the loads shall be used.

(j) Suspension ropes supporting adjustable suspension scaffolds shall be of a diameter large enough to provide sufficient surface area for the functioning of brake and hoist mechanisms.

(k) Suspension ropes shall be shielded from heat-producing processes. When acids or other corrosive substances are used on a scaffold, the ropes shall be shielded, treated to protect against the corrosive substances, or shall be of a material that will not be damaged by the substance being used.

(l) Work on or from scaffolds is prohibited during storms or high winds unless a competent person has determined that it is safe for employees to be on the scaffold and those employees are protected by a personal fall arrest system or wind screens. Wind screens shall not be used unless the scaffold is secured against the anticipated wind forces imposed.

(m) Debris shall not be allowed to accumulate on platforms.

(n) Makeshift devices, such as but not limited to boxes and barrels, shall not be used on top of scaffold platforms to increase the working level height of employees.

(o) Ladders shall not be used on scaffolds to increase the working level height of employees, except on large area scaffolds where employers have satisfied the following criteria:

(i) When the ladder is placed against a structure which is not a part of the scaffold, the scaffold shall be secured against the sideways thrust exerted by the ladder;

(ii) The platform units shall be secured to the scaffold to prevent their movement;

(iii) The ladder legs shall be on the same platform or other means shall be provided to stabilize the ladder against unequal platform deflection; and

(iv) The ladder legs shall be secured to prevent them from slipping or being pushed off the platform.

(p) Platforms shall not deflect more than 1/60 of the span when loaded.

(q) To reduce the possibility of welding current arcing through the suspension wire rope when performing welding from suspended scaffolds, the following precautions shall be taken, as applicable:

(i) An insulated thimble shall be used to attach each suspension wire rope to its hanging support (such as cornice hook or outrigger). Excess suspension wire rope and any additional independent lines from grounding shall be insulated;

(ii) The suspension wire rope shall be covered with insulating material extending at least 4 feet (1.2 m) above the hoist. If there is a tail line below the hoist, it shall be insulated to prevent contact with the platform. The portion of the tail line that hangs free below the scaffold shall be guided or retained, or both, so that it does not become grounded;

(iii) Each hoist shall be covered with insulated protective covers;

(iv) In addition to a work lead attachment required by the welding process, a grounding conductor shall be connected from the scaffold to the structure. The size of this conductor shall be at least the size of the welding process work lead, and this conductor shall not be in series with the welding process or the work piece;

(v) If the scaffold grounding lead is disconnected at any time, the welding machine shall be shut off; and

(vi) An active welding rod or uninsulated welding lead shall not be allowed to contact the scaffold or its suspension system.

(7) "Fall protection."

(a) Each employee on a scaffold more than 10 feet (3.1 m) above a lower level shall be protected from falling to that lower level. Subsection (7)(a)(i) through (vii) of this section establish the types of fall protection to be provided to the employees on each type of scaffold. Subsection (7)(b) of this section addresses fall protection for scaffold erectors and dismantlers.

Note to subsection (7)(a): The fall protection requirements for employees installing suspension scaffold support systems on floors, roofs, and other elevated surfaces are set forth in Parts C-1 and K of this chapter.

(i) Each employee on a boatswains' chair, catenary scaffold, float scaffold, needle beam scaffold, or ladder jack scaffold shall be protected by a personal fall arrest system;

(ii) Each employee on a single-point or two-point adjustable suspension scaffold shall be protected by both a personal fall arrest system and guardrail system;

(iii) Each employee on a crawling board (chicken ladder) shall be protected by a personal fall arrest system, a guardrail system (with minimum 200 pound toprail capacity), or by a three-fourth inch (1.9 cm) diameter grabline or equivalent handhold securely fastened beside each crawling board;

(iv) Each employee on a self-contained adjustable scaffold shall be protected by a guardrail system (with minimum 200 pound toprail capacity) when the platform is supported by the frame structure, and by both a personal fall arrest sys-

tem and a guardrail system (with minimum 200 pound toprail capacity) when the platform is supported by ropes;

(v) Each employee on a walkway located within a scaffold shall be protected by a guardrail system (with minimum 200 pound toprail capacity) installed within 9 1/2 inches (24.1 cm) of and along at least one side of the walkway;

(vi) Each employee performing overhand bricklaying operations from a supported scaffold shall be protected from falling from all open sides and ends of the scaffold (except at the side next to the wall being laid) by the use of a personal fall arrest system or guardrail system (with minimum 200 pound toprail capacity);

(vii) For all scaffolds not otherwise specified in (a)(i) through (vi) of this subsection, each employee shall be protected by the use of personal fall arrest systems or guardrail systems meeting the requirements of (d) of this subsection.

(b) The employer shall have a competent person determine the feasibility and safety of providing fall protection for employees erecting or dismantling supported scaffolds. Employers are required to provide fall protection for employees erecting or dismantling supported scaffolds where the installation and use of such protection is feasible and does not create a greater hazard. The maximum feasible fall protection shall be used.

(c) In addition to meeting the requirements of chapter 296-155 WAC, Part C-1, personal fall arrest systems used on scaffolds shall be attached by lanyard to a vertical lifeline, horizontal lifeline, or appropriate structural member. Vertical lifelines shall not be used when overhead components, such as overhead protection or additional platform levels, are part of a single-point or two-point adjustable suspension scaffold.

(i) When vertical lifelines are used, they shall be fastened to a fixed safe point of anchorage, shall be independent of the scaffold, and shall be protected from sharp edges and abrasion. Safe points of anchorage include structural members of buildings, but do not include standpipes, vents, other piping systems, electrical conduit, outrigger beams, or counterweights.

(ii) When horizontal lifelines are used, they shall be secured to two or more structural members of the scaffold, or they may be looped around both suspension and independent suspension lines (on scaffolds so equipped) above the hoist and brake attached to the end of the scaffold. Horizontal lifelines shall not be attached only to the suspension ropes.

(iii) When lanyards are connected to horizontal lifelines or structural members on a single-point or two-point adjustable suspension scaffold, the scaffold shall be equipped with additional independent support lines and automatic locking devices capable of stopping the fall of the scaffold in the event one or both of the suspension ropes fail. The independent support lines shall be equal in number and strength to the suspension ropes.

(iv) Vertical lifelines, independent support lines, and suspension ropes shall not be attached to each other, nor shall they be attached to or use the same point of anchorage, nor shall they be attached to the same point on the scaffold or personal fall arrest system.

(d) Guardrail systems installed to meet the requirements of this section shall comply with the following provisions (guardrail systems built in accordance with Appendix A to

this part will be deemed to meet the requirements of (d)(vii), (viii), and (ix) of this subsection):

(i) Guardrail systems shall be installed along all open sides and ends of platforms. Guardrail systems shall be installed before the scaffold is released for use by employees other than erection/dismantling crews.

(ii) The top edge height of top rails or equivalent member on supported scaffolds manufactured or first placed in service after January 1, 2000, shall be installed between 38 inches (0.97 m) and 45 inches (1.2 m) above the platform surface. The top edge height on supported scaffolds manufactured and placed in service before January 1, 2000, and on all suspended scaffolds where both a guardrail and a personal fall arrest system are required shall be between 36 inches (0.9 m) and 45 inches (1.2 m). When conditions warrant, the height of the top edge may exceed the 45-inch height, provided the guardrail system meets all other criteria of (d) of this subsection.

(iii) When midrails, screens, mesh, intermediate vertical members, solid panels, or equivalent structural members are used, they shall be installed between the top edge of the guardrail system and the scaffold platform.

(iv) When midrails are used, they shall be installed at a height approximately midway between the top edge of the guardrail system and the platform surface.

(v) When screens and mesh are used, they shall extend from the top edge of the guardrail system to the scaffold platform, and along the entire opening between the supports.

(vi) When intermediate members (such as balusters or additional rails) are used, they shall not be more than 19 inches (48 cm) apart.

(vii) Each top rail or equivalent member of a guardrail system shall be capable of withstanding, without failure, a force applied in any downward or horizontal direction at any point along its top edge of at least 100 pounds (445 n) for guardrail systems installed on single-point adjustable suspension scaffolds or two-point adjustable suspension scaffolds, and at least 200 pounds (890 n) for guardrail systems installed on all other scaffolds.

(viii) When the loads specified in (d)(vii) of this subsection are applied in a downward direction, the top edge shall not drop below the height above the platform surface that is prescribed in (d)(ii) of this subsection.

(ix) Midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members of a guardrail system shall be capable of withstanding, without failure, a force applied in any downward or horizontal direction at any point along the midrail or other member of at least 75 pounds (333 n) for guardrail systems with a minimum 100 pound top rail capacity, and at least 150 pounds (666 n) for guardrail systems with a minimum 200 pound top rail capacity.

(x) Suspension scaffold hoists and nonwalk-through stirrups may be used as end guardrails, if the space between the hoist or stirrup and the side guardrail or structure does not allow passage of an employee to the end of the scaffold.

(xi) Guardrails shall be surfaced to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.

(xii) The ends of all rails shall not overhang the terminal posts except when such overhang does not constitute a projection hazard to employees.

(xiii) Steel or plastic banding shall not be used as a top rail or midrail.

(xiv) Manila or plastic (or other synthetic) rope being used for top rails or midrails shall be inspected by a competent person as frequently as necessary to ensure that it continues to meet the strength requirements of subsection (7) of this section.

(xv) Crossbraces may be used in lieu of either the top rail or midrail providing the resulting guardrail system meets all the other criteria of (d) of this subsection and this does not result in openings in the guardrail system or between the guardrail system and the platform through which a nineteen-inch diameter sphere can pass.

(8) "Falling object protection."

(a) In addition to wearing hardhats each employee on a scaffold shall be provided with additional protection from falling hand tools, debris, and other small objects through the installation of toeboards, screens, or guardrail systems, or through the erection of debris nets, catch platforms, or canopy structures that contain or deflect the falling objects. When the falling objects are too large, heavy or massive to be contained or deflected by any of the above-listed measures, the employer shall place such potential falling objects away from the edge of the surface from which they could fall and shall secure those materials as necessary to prevent their falling.

(b) Where there is a danger of tools, materials, or equipment falling from a scaffold and striking employees below, the following provisions apply:

(i) The area below the scaffold to which objects can fall shall be barricaded, and employees shall not be permitted to enter the hazard area; or

(ii) A toeboard shall be erected along the edge of platforms above lower levels for a distance sufficient to protect employees below, except on float (ship) scaffolds where an edging of 3/4 x 1 1/2 inch (2 x 4 cm) wood or equivalent may be used in lieu of toeboards; or

(iii) Where tools, materials, or equipment are piled to a height higher than the top edge of the toeboard, paneling or screening extending from the toeboard or platform to the top of the guardrail shall be erected for a distance sufficient to protect employees below; or

(iv) A guardrail system shall be installed with openings small enough to prevent passage of potential falling objects; or

(v) A canopy structure, debris net, or catch platform strong enough to withstand the impact forces of the potential falling objects shall be erected over the employees below.

(c) Canopies, when used for falling object protection, shall comply with the following criteria:

(i) Canopies shall be installed between the falling object hazard and the employees.

(ii) When canopies are used on suspension scaffolds for falling object protection, the scaffold shall be equipped with additional independent support lines equal in number to the number of points supported, and equivalent in strength to the strength of the suspension ropes.

(iii) Independent support lines and suspension ropes shall not be attached to the same points of anchorage.

(d) Where used, toeboards shall be:

(i) Capable of withstanding, without failure, a force of at least 50 pounds (222 n) applied in any downward or horizontal direction at any point along the toeboard (toeboards built in accordance with Appendix A to this part will be deemed to meet this requirement); and

(ii) At least three and one-half inches (9 cm) high from the top edge of the toeboard to the level of the walking/working surface. Toeboards shall be securely fastened in place at the outermost edge of the platform and have not more than 1/4 inch (0.7 cm) clearance above the walking/working surface. Toeboards shall be solid or with openings not over one inch (2.5 cm) in the greatest dimension.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-483, filed 2/13/98, effective 4/15/98. Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-483, filed 11/22/91, effective 12/24/91.]

WAC 296-155-484 Additional requirements applicable to specific types of scaffolds. In addition to the applicable requirements of WAC 296-155-483, the following requirements apply to the specific types of scaffolds indicated. Scaffolds not specifically addressed by WAC 296-155-484, such as but not limited to systems scaffolds, must meet the requirements of WAC 296-155-483.

(1) "Pole scaffolds."

(a) When platforms are being moved to the next level, the existing platform shall be left undisturbed until the new bearers have been set in place and braced, prior to receiving the new platforms.

(b) Crossbracing shall be installed between the inner and outer sets of poles on double pole scaffolds.

(c) Diagonal bracing in both directions shall be installed across the entire inside face of double-pole scaffolds used to support loads equivalent to a uniformly distributed load of 50 pounds (222 kg) or more per square foot (929 square cm).

(d) Diagonal bracing in both directions shall be installed across the entire outside face of all double- and single-pole scaffolds.

(e) Runners and bearers shall be installed on edge.

(f) Bearers shall extend a minimum of 3 inches (7.6 cm) over the outside edges of runners.

(g) Runners shall extend over a minimum of two poles, and shall be supported by bearing blocks securely attached to the poles.

(h) Braces, bearers, and runners shall not be spliced between poles.

(i) Where wooden poles are spliced, the ends shall be squared and the upper section shall rest squarely on the lower section. Wood splice plates shall be provided on at least two adjacent sides, and shall extend at least 2 feet (0.6 m) on either side of the splice, overlap the abutted ends equally, and have at least the same cross-sectional areas as the pole. Splice plates of other materials of equivalent strength may be used.

(j) Pole scaffolds over 60 feet in height shall be designed by a registered professional engineer, and shall be constructed and loaded in accordance with that design. Nonmandatory Appendix A to this part contains examples of criteria

that will enable an employer to comply with design and loading requirements for pole scaffolds under 60 feet in height.

(2) "Tube and coupler scaffolds."

(a) When platforms are being moved to the next level, the existing platform shall be left undisturbed until the new bearers have been set in place and braced prior to receiving the new platforms.

(b) Transverse bracing forming an "X" across the width of the scaffold shall be installed at the scaffold ends and at least at every third set of posts horizontally (measured from only one end) and every fourth runner vertically. Bracing shall extend diagonally from the inner or outer posts or runners upward to the next outer or inner posts or runners. Building ties shall be installed at the bearer levels between the transverse bracing and shall conform to the requirements of WAC 296-155-483 (3)(a).

(c) On straight run scaffolds, longitudinal bracing across the inner and outer rows of posts shall be installed diagonally in both directions, and shall extend from the base of the end posts upward to the top of the scaffold at approximately a 45 degree angle. On scaffolds whose length is greater than their height, such bracing shall be repeated beginning at least at every fifth post. On scaffolds whose length is less than their height, such bracing shall be installed from the base of the end posts upward to the opposite end posts, and then in alternating directions until reaching the top of the scaffold. Bracing shall be installed as close as possible to the intersection of the bearer and post or runner and post.

(d) Where conditions preclude the attachment of bracing to posts, bracing shall be attached to the runners as close to the post as possible.

(e) Bearers shall be installed transversely between posts, and when coupled to the posts, shall have the inboard coupler bear directly on the runner coupler. When the bearers are coupled to the runners, the couplers shall be as close to the posts as possible.

(f) Bearers shall extend beyond the posts and runners, and shall provide full contact with the coupler.

(g) Runners shall be installed along the length of the scaffold, located on both the inside and outside posts at level heights (when tube and coupler guardrails and midrails are used on outside posts, they may be used in lieu of outside runners).

(h) Runners shall be interlocked on straight runs to form continuous lengths, and shall be coupled to each post. The bottom runners and bearers shall be located as close to the base as possible.

(i) Couplers shall be of a structural metal, such as drop-forged steel, malleable iron, or structural grade aluminum. The use of gray cast iron is prohibited.

(j) Tube and coupler scaffolds over 125 feet in height shall be designed by a registered professional engineer, and shall be constructed and loaded in accordance with such design. Nonmandatory Appendix A to this part contains examples of criteria that will enable an employer to comply with design and loading requirements for tube and coupler scaffolds under 125 feet in height.

(3) "Fabricated frame scaffolds" (tubular welded frame scaffolds).

(a) When moving platforms to the next level, the existing platform shall be left undisturbed until the new end frames have been set in place and braced prior to receiving the new platforms.

(b) Frames and panels shall be braced by cross, horizontal, or diagonal braces, or combination thereof, which secure vertical members together laterally. The cross braces shall be of such length as will automatically square and align vertical members so that the erected scaffold is always plumb, level, and square. All brace connections shall be secured.

(c) Frames and panels shall be joined together vertically by coupling or stacking pins or equivalent means.

(d) Where uplift can occur which would displace scaffold end frames or panels, the frames or panels shall be locked together vertically by pins or equivalent means.

(e) Brackets used to support cantilevered loads shall:

(i) Be seated with side-brackets parallel to the frames and end-brackets at 90 degrees to the frames;

(ii) Not be bent or twisted from these positions; and

(iii) Be used only to support personnel, unless the scaffold has been designed for other loads by a qualified engineer and built to withstand the tipping forces caused by those other loads being placed on the bracket-supported section of the scaffold.

(f) Scaffolds over 125 feet (38.0 m) in height above their base plates shall be designed by a registered professional engineer, and shall be constructed and loaded in accordance with such design.

(4) "Plasterers', decorators', and large area scaffolds." Scaffolds shall be constructed in accordance with subsection (1), (2), or (3) of this section, as appropriate.

(5) "Bricklayers' square scaffolds (squares)."

(a) Scaffolds made of wood shall be reinforced with gussets on both sides of each corner.

(b) Diagonal braces shall be installed on all sides of each square.

(c) Diagonal braces shall be installed between squares on the rear and front sides of the scaffold, and shall extend from the bottom of each square to the top of the next square.

(d) Scaffolds shall not exceed three tiers in height, and shall be so constructed and arranged that one square rests directly above the other. The upper tiers shall stand on a continuous row of planks laid across the next lower tier, and shall be nailed down or otherwise secured to prevent displacement.

(6) "Horse scaffolds."

(a) Scaffolds shall not be constructed or arranged more than two tiers or 10 feet (3.0 m) in height, whichever is less.

(b) When horses are arranged in tiers, each horse shall be placed directly over the horse in the tier below.

(c) When horses are arranged in tiers, the legs of each horse shall be nailed down or otherwise secured to prevent displacement.

(d) When horses are arranged in tiers, each tier shall be crossbraced.

(7) "Form scaffolds and carpenters' bracket scaffolds."

(a) Each bracket, except those for wooden bracket-form scaffolds, shall be attached to the supporting formwork or structure by means of one or more of the following: Nails; a metal stud attachment device; welding; hooking over a secured structural supporting member, with the form wales

either bolted to the form or secured by snap ties or tie bolts extending through the form and securely anchored; or, for carpenters' bracket scaffolds only, by a bolt extending through to the opposite side of the structure's wall.

(b) Wooden bracket-form scaffolds shall be an integral part of the form panel.

(c) Folding type metal brackets, when extended for use, shall be either bolted or secured with a locking-type pin.

(8) "Roof bracket scaffolds."

(a) Scaffold brackets shall be constructed to fit the pitch of the roof and shall provide a level support for the platform.

(b) Brackets (including those provided with pointed metal projections) shall be anchored in place by nails unless it is impractical to use nails. When nails are not used, brackets shall be secured in place with first-grade manila rope of at least three-fourth inch (1.9 cm) diameter, or equivalent.

(9) "Outrigger scaffolds."

(a) The inboard end of outrigger beams, measured from the fulcrum point to the extreme point of anchorage, shall be not less than one and one-half times the outboard end in length.

(b) Outrigger beams fabricated in the shape of an I-beam or channel shall be placed so that the web section is vertical.

(c) The fulcrum point of outrigger beams shall rest on secure bearings at least 6 inches (15.2 cm) in each horizontal dimension.

(d) Outrigger beams shall be secured in place against movement, and shall be securely braced at the fulcrum point against tipping.

(e) The inboard ends of outrigger beams shall be securely anchored either by means of braced struts bearing against sills in contact with the overhead beams or ceiling, or by means of tension members secured to the floor joists underfoot, or by both.

(f) The entire supporting structure shall be securely braced to prevent any horizontal movement.

(g) To prevent their displacement, platform units shall be nailed, bolted, or otherwise secured to outriggers.

(h) Scaffolds and scaffold components shall be designed by a registered professional engineer and shall be constructed and loaded in accordance with such design.

(10) "Pump jack scaffolds."

(a) Pump jack brackets, braces, and accessories shall be fabricated from metal plates and angles. Each pump jack bracket shall have two positive gripping mechanisms to prevent any failure or slippage.

(b) Poles shall be secured to the structure by rigid triangular bracing or equivalent at the bottom, top, and other points as necessary. When the pump jack has to pass bracing already installed, an additional brace shall be installed approximately 4 feet (1.2 m) above the brace to be passed, and shall be left in place until the pump jack has been moved and the original brace reinstalled.

(c) When guardrails are used for fall protection, a work-bench may be used as the toprail only if it meets all the requirements in WAC 296-155-483 (7)(d)(ii), (vii), (viii), and (xiii).

(d) Work benches shall not be used as scaffold platforms.

(e) When poles are made of wood, the pole lumber shall be straight-grained, free of shakes, large loose or dead knots, and other defects which might impair strength.

(f) When wood poles are constructed of two continuous lengths, they shall be joined together with the seam parallel to the bracket.

(g) When two by fours are spliced to make a pole, mending plates shall be installed at all splices to develop the full strength of the member.

(11) "Ladder jack scaffolds."

(a) Platforms shall not exceed a height of 20 feet (6.1 m).

(b) All ladders used to support ladder jack scaffolds shall meet the requirements of Part J of this chapter — Stairways and ladders, except that job-made ladders shall not be used to support ladder jack scaffolds.

(c) The ladder jack shall be so designed and constructed that it will bear on the side rails and ladder rungs or on the ladder rungs alone. If bearing on rungs only, the bearing area shall include a length of at least 10 inches (25.4 cm) on each rung.

(d) Ladders used to support ladder jacks shall be placed, fastened, or equipped with devices to prevent slipping.

(e) Scaffold platforms shall not be bridged one to another.

(12) "Window jack scaffolds."

(a) Scaffolds shall be securely attached to the window opening.

(b) Scaffolds shall be used only for the purpose of working at the window opening through which the jack is placed.

(c) Window jacks shall not be used to support planks placed between one window jack and another, or for other elements of scaffolding.

(13) "Crawling boards (chicken ladders)."

(a) Crawling boards shall extend from the roof peak to the eaves when used in connection with roof construction, repair, or maintenance.

(b) Crawling boards shall be secured to the roof by ridge hooks or by means that meet equivalent criteria (e.g., strength and durability).

(14) "Step, platform, and trestle ladder scaffolds."

(a) Scaffold platforms shall not be placed any higher than the second highest rung or step of the ladder supporting the platform.

(b) All ladders used in conjunction with step, platform and trestle ladder scaffolds shall meet the pertinent requirements of Part J of this chapter — Stairways and ladders, except that job-made ladders shall not be used to support such scaffolds.

(c) Ladders used to support step, platform, and trestle ladder scaffolds shall be placed, fastened, or equipped with devices to prevent slipping.

(d) Scaffolds shall not be bridged one to another.

(15) "Single-point adjustable suspension scaffolds."

(a) When two single-point adjustable suspension scaffolds are combined to form a two-point adjustable suspension scaffold, the resulting two-point scaffold shall comply with the requirements for two-point adjustable suspension scaffolds in subsection (16) of this section.

(b) The supporting rope between the scaffold and the suspension device shall be kept vertical unless all of the following conditions are met:

(i) The rigging has been designed by a qualified person; and

(ii) The scaffold is accessible to rescuers; and

(iii) The supporting rope is protected to ensure that it will not chafe at any point where a change in direction occurs; and

(iv) The scaffold is positioned so that swinging cannot bring the scaffold into contact with another surface.

(c) Boatswains' chair tackle shall consist of correct size ball bearings or bushed blocks containing safety hooks and properly "eye-spliced" minimum five-eighth (5/8) inch (1.6 cm) diameter first-grade manila rope, or other rope which will satisfy the criteria (e.g., strength and durability) of manila rope.

(d) Boatswains' chair seat slings shall be reeved through four corner holes in the seat; shall cross each other on the underside of the seat; and shall be rigged so as to prevent slippage which could cause an out-of-level condition.

(e) Boatswains' chair seat slings shall be a minimum of five-eighth (5/8) inch (1.6 cm) diameter fiber, synthetic, or other rope which will satisfy the criteria (e.g., strength, slip resistance, durability, etc.) of first grade manila rope.

(f) When a heat-producing process such as gas or arc welding is being conducted, boatswains' chair seat slings shall be a minimum of three-eighth (3/8) inch (1.0 cm) wire rope.

(g) Noncross-laminated wood boatswains' chairs shall be reinforced on their underside by cleats securely fastened to prevent the board from splitting.

(16) "Two-point adjustable suspension scaffolds (swing stages)." The following requirements do not apply to two-point adjustable suspension scaffolds used as masons' or stonemasons' scaffolds. Such scaffolds are covered by subsection (17) of this section.

(a) Platforms shall not be more than 36 inches (0.9 m) wide unless designed by a qualified person to prevent unstable conditions.

(b) The platform shall be securely fastened to hangers (stirrups) by U-bolts or by other means which satisfy the requirements of WAC 296-155-483(1).

(c) The blocks for fiber or synthetic ropes shall consist of at least one double and one single block. The sheaves of all blocks shall fit the size of the rope used.

(d) Platforms shall be of the ladder-type, plank-type, beam-type, or light-metal type. Light metal-type platforms having a rated capacity of 750 pounds or less and platforms 40 feet (12.2 m) or less in length shall be tested and listed by a nationally recognized testing laboratory.

(e) Two-point scaffolds shall not be bridged or otherwise connected one to another during raising and lowering operations unless the bridge connections are articulated (attached), and the hoists properly sized.

(f) Passage may be made from one platform to another only when the platforms are at the same height, are abutting, and walk-through stirrups specifically designed for this purpose are used.

(17) "Multipoint adjustable suspension scaffolds, stone-setters' multipoint adjustable suspension scaffolds, and masons' multipoint adjustable suspension scaffolds."

(a) When two or more scaffolds are used they shall not be bridged one to another unless they are designed to be bridged, the bridge connections are articulated, and the hoists are properly sized.

(b) If bridges are not used, passage may be made from one platform to another only when the platforms are at the same height and are abutting.

(c) Scaffolds shall be suspended from metal outriggers, brackets, wire rope slings, hooks, or means that meet equivalent criteria (e.g., strength, durability).

(18) "Catenary scaffolds."

(a) No more than one platform shall be placed between consecutive vertical pickups, and no more than two platforms shall be used on a catenary scaffold.

(b) Platforms supported by wire ropes shall have hook-shaped stops on each end of the platforms to prevent them from slipping off the wire ropes. These hooks shall be so placed that they will prevent the platform from falling if one of the horizontal wire ropes breaks.

(c) Wire ropes shall not be tightened to the extent that the application of a scaffold load will overstress them.

(d) Wire ropes shall be continuous and without splices between anchors.

(19) "Float (ship) scaffolds."

(a) The platform shall be supported by a minimum of two bearers, each of which shall project a minimum of 6 inches (15.2 cm) beyond the platform on both sides. Each bearer shall be securely fastened to the platform.

(b) Rope connections shall be such that the platform cannot shift or slip.

(c) When only two ropes are used with each float:

(i) They shall be arranged so as to provide four ends which are securely fastened to overhead supports.

(ii) Each supporting rope shall be hitched around one end of the bearer and pass under the platform to the other end of the bearer where it is hitched again, leaving sufficient rope at each end for the supporting ties.

(20) "Interior hung scaffolds."

(a) Scaffolds shall be suspended only from the roof structure or other structural member such as ceiling beams.

(b) Overhead supporting members (roof structure, ceiling beams, or other structural members) shall be inspected and checked for strength before the scaffold is erected.

(c) Suspension ropes and cables shall be connected to the overhead supporting members by shackles, clips, thimbles, or other means that meet equivalent criteria (e.g., strength, durability).

(21) "Needle beam scaffolds."

(a) Scaffold support beams shall be installed on edge.

(b) Ropes or hangers shall be used for supports, except that one end of a needle beam scaffold may be supported by a permanent structural member.

(c) The ropes shall be securely attached to the needle beams.

(d) The support connection shall be arranged so as to prevent the needle beam from rolling or becoming displaced.

(e) Platform units shall be securely attached to the needle beams by bolts or equivalent means. Cleats and overhang are not considered to be adequate means of attachment.

(22) "Multilevel suspended scaffolds."

(a) Scaffolds shall be equipped with additional independent support lines, equal in number to the number of points supported, and of equivalent strength to the suspension ropes, and rigged to support the scaffold in the event the suspension rope(s) fail.

(b) Independent support lines and suspension ropes shall not be attached to the same points of anchorage.

(c) Supports for platforms shall be attached directly to the support stirrup and not to any other platform.

(23) "Mobile scaffolds."

(a) Scaffolds shall be braced by cross, horizontal, or diagonal braces, or combination thereof, to prevent racking or collapse of the scaffold and to secure vertical members together laterally so as to automatically square and align the vertical members. Scaffolds shall be plumb, level, and squared. All brace connections shall be secured.

(i) Scaffolds constructed of tube and coupler components shall also comply with the requirements of subsection (2) of this section;

(ii) Scaffolds constructed of fabricated frame components shall also comply with the requirements of subsection (3) of this section.

(b) Scaffold casters and wheels shall be locked with positive wheel and/or wheel and swivel locks, or equivalent means, to prevent movement of the scaffold while the scaffold is used in a stationary manner.

(c) Manual force used to move the scaffold shall be applied as close to the base as practicable, but not more than 5 feet (1.5 m) above the supporting surface.

(d) Power systems used to propel mobile scaffolds shall be designed for such use. Forklifts, trucks, similar motor vehicles or add-on motors shall not be used to propel scaffolds unless the scaffold is designed for such propulsion systems.

(e) Scaffolds shall be stabilized to prevent tipping during movement.

(f) Employees shall not be allowed to ride on scaffolds unless the following conditions exist:

(i) The surface on which the scaffold is being moved is within 3 degrees of level, and free of pits, holes, and obstructions;

(ii) The height to base width ratio of the scaffold during movement is two to one or less, unless the scaffold is designed and constructed to meet or exceed nationally recognized stability test requirements such as those listed in (ANSI/SIA A92.5 and A92.6);

(iii) Outrigger frames, when used, are installed on both sides of the scaffold;

(iv) When power systems are used, the propelling force is applied directly to the wheels, and does not produce a speed in excess of 1 foot per second (.3 mps); and

(v) No employee is on any part of the scaffold which extends outward beyond the wheels, casters, or other supports.

(g) Platforms shall not extend outward beyond the base supports of the scaffold unless outrigger frames or equivalent devices are used to ensure stability.

(h) Where leveling of the scaffold is necessary, screw jacks or equivalent means shall be used.

(i) Caster stems and wheel stems shall be pinned or otherwise secured in scaffold legs or adjustment screws.

(j) Where uplift may occur, panels shall be locked together vertically by pins or other equivalent means.

(k) Before a scaffold is moved, each employee on the scaffold shall be made aware of the move.

(24) "Repair bracket scaffolds."

(a) Brackets shall be secured in place by at least one wire rope at least 1/2 inch (1.27 cm) in diameter.

(b) Each bracket shall be attached to the securing wire rope (or ropes) by a positive locking device capable of preventing the unintentional detachment of the bracket from the rope, or by equivalent means.

(c) Each bracket, at the contact point between the supporting structure and the bottom of the bracket, shall be provided with a shoe (heel block or foot) capable of preventing the lateral movement of the bracket.

(d) Platforms shall be secured to the brackets in a manner that will prevent the separation of the platforms from the brackets and the movement of the platforms or the brackets on a completed scaffold.

(e) When a wire rope is placed around the structure in order to provide a safe anchorage for personal fall arrest systems used by employees erecting or dismantling scaffolds, the wire rope shall meet the requirements of Part C-1 of this chapter, but shall be at least 5/16 inch (0.8 cm) in diameter.

(f) Each wire rope used for securing brackets in place or as an anchorage for personal fall arrest systems shall be protected from damage due to contact with edges, corners, protrusions, or other discontinuities of the supporting structure or scaffold components.

(g) Tensioning of each wire rope used for securing brackets in place or as an anchorage for personal fall arrest systems shall be by means of a turnbuckle at least 1 inch (2.54 cm) in diameter, or by equivalent means.

(h) Each turnbuckle shall be connected to the other end of its rope by use of an eyesplice thimble of a size appropriate to the turnbuckle to which it is attached.

(i) U-bolt wire rope clips shall not be used on any wire rope used to secure brackets or to serve as an anchor for personal fall arrest systems.

(j) The employer shall ensure that materials shall not be dropped to the outside of the supporting structure.

(k) Scaffold erection shall progress in only one direction around any structure.

(25) "Stilts." Stilts, when used, shall be used in accordance with the following requirements:

(a) An employee may wear stilts on a scaffold only if it is a large area scaffold.

(b) When an employee is using stilts on a large area scaffold where a guardrail system is used to provide fall protection, the guardrail system shall be increased in height by an amount equal to the height of the stilts being used by the employee.

(c) Surfaces on which stilts are used shall be flat and free of pits, holes and obstructions, such as debris, as well as other tripping and falling hazards.

(d) Stilts shall be properly maintained. Any alteration of the original equipment shall be approved by the manufacturer.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-484, filed 2/13/98, effective 4/15/98.]

WAC 296-155-485 Reserved.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-485, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 96-24-051, § 296-155-485, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-485, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-485, filed 7/20/94, effective 9/20/94; 91-24-017 (Order 91-07), § 296-155-485, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-485, filed 1/10/91, effective 2/12/91; 90-03-029 (Order 89-20), § 296-155-485, filed 1/11/90, effective 2/26/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-485, filed 1/21/86; 82-08-026 (Order 82-10), § 296-155-485, filed 3/30/82. Statutory Authority: RCW 49.17.040, 49.17.150, and 49.17.240. 79-08-115 (Order 79-9), § 296-155-485, filed 7/31/79; Order 76-29, § 296-155-485, filed 9/30/76; Order 76-6, § 296-155-485, filed 3/1/76; Order 74-26, § 296-155-485, filed 5/7/74, effective 6/6/74.]

WAC 296-155-487 Manually propelled elevating work platforms. (1) All applicable rules for design, construction, maintenance, operation, testing and use of manually propelled elevating work platforms shall be in accordance with ANSI A92.3-1990.

(2) General requirements.

(a) Any manually propelled elevating work platform, when raised to its maximum working height, on level ground, shall be capable of sustaining, without reaching instability, a minimum horizontal test force of fifty pounds or fifteen percent of the rated capacity, whichever is greater, applied to any point on the perimeter of the platform while the platform is carrying the rated work load.

(b) Any manually propelled elevating work platform, unless designed for such use by the manufacturer, shall not be used on an inclined surface.

(c) Any work platform designed by the manufacturer to be operated on an inclined surface shall also be capable of passing the stability tests outlined in (a) of this subsection while on such a surface. Procedures for maintaining stability shall be clearly outlined in the special warnings section of the operating instructions and users shall follow these instructions.

(d) If outriggers or stabilizers must be employed to meet the tests for stability outlined in (a) of this subsection, the operating instructions shall require their use and such outriggers or stabilizers shall be provided and used.

(e) The platform width shall not be less than eighteen inches and shall be provided with a surface to minimize slipping.

(f) The platform shall be provided with a guardrail or other structure around its upper periphery and the guardrail shall be approximately forty-two inches high, plus or minus three inches, with a midrail approximately midway between the top rail and the platform surface.

(i) The guardrail system shall be designed and constructed to withstand a load of twenty-five pounds per linear foot applied in a horizontal direction to the top rail or midrail.

(ii) The top rail or midrail shall withstand a concentrated load of three hundred pounds applied vertically to the top of either rail midway between the supporting posts.

(iii) Guardrail terminal posts shall withstand two hundred pounds applied in any direction at the top of the post.

(g) The platform shall be provided with four-inch (nominal dimension) toeboards on all sides.

(h) Toeboards may be omitted at the access openings.

(i) The configuration of the work platform shall include access for personnel to use in reaching the platform deck when it is in the lowered position.

(i) Any access system used in this way shall have rungs or steps located on uniform centers not to exceed sixteen inches.

(ii) Steps or rungs shall be provided with a face that minimizes slipping.

(3) Safety factor specifications.

(a) Where the platform is supporting its rated work load by a system of wire ropes or chains, or both, the safety factor of the wire rope or chain shall not be less than eight to one, based on ultimate strength.

(b) All critical components of a hydraulic or pneumatic system used in a work platform shall have a bursting strength that exceeds the pressure attained when the system is subjected to the equivalent of four times the rated work load. (Critical components are those in which failure would result in a free descent.)

(c) All noncritical hydraulic components shall have a bursting strength safety factor of at least two to one.

(4) Fail safe requirements.

(a) Where the elevation of the platform is accomplished by an electromechanical assembly, the system shall be designed to prevent free descent in the event of a generator or power failure.

(b) Where the elevation of the platform is accomplished by a hydraulic or pneumatic cylinder assembly, the system shall be so equipped as to prevent free descent in the event of failure of a hydraulic or pneumatic line.

(c) Where the platform is horizontally extendable beyond the base of the machine, the system shall be so equipped as to prevent descent in the event of failure of a hydraulic or pneumatic line, wire rope, or chain.

(d) Where the elevation of the platform is accomplished by a single hoist cable, the system shall be protected by a broken-cable safety device which will prevent free descent of the platform.

(e) Where the elevation of the platform is accomplished by a manual-mechanical or manual-hydraulic assembly, the considerations established above shall apply.

(f) The control system shall be designed so that a single malfunction in the control system will not result in unintended machine motion.

(g) Hydraulically or pneumatically actuated outriggers or stabilizers, or both, shall be so constructed as to prevent their retraction in the event of failure of a hydraulic or pneumatic line.

(5) Emergency lowering means. Any work platform equipped with a powered elevating assembly shall be supplied with clearly marked emergency lowering means readily accessible from ground or floor level.

(6) Guarding. Mechanical power transmission apparatus shall be guarded in accordance with WAC 296-24-205, General safety and health standards.

(7) Directional controls.

(a) All directional controls shall be marked for the direction they control and shall be of the type which automatically returns to the "off" or the neutral position when released.

(b) Controls shall be protected against inadvertent operation.

(8) Motor requirements.

(a) Fuel lines of internal-combustion-engine-powered work platforms shall be supported to minimize chafing and positioned to minimize exposure to engine exhaust heat. Liquid fuel lines shall be hard lines except where isolation from vibration requires a flexible connection.

(b) LP-gas engine fuel systems shall comply with the American National Standard for Storage and Handling of Liquefied Petroleum Gases, ANSI/NFPA 58-1995.

(c) The exhaust system shall be provided with a muffler that is positioned to minimize exposure to noise and exhaust gas of the operators and personnel located in proximity to the unit.

(9) Prevention of lateral movement. Each work platform shall be provided with locking screws, floor locks, wheel-locking mechanisms, or other means of preventing unintended lateral motions while in use.

(10) Specifications display. The following information shall be displayed on all work platforms in as permanent and as visible a manner as practical:

(a) Warnings, cautions, or restrictions for safe operation in accordance with American National Standard Specifications for Accident Prevention Signs, ANSI Z535.2-1991.

(b) Make, model, serial number, and manufacturer's name and address.

(c) Rated work load.

(d) Maximum platform height.

(e) Nominal voltage rating of batteries or rated voltage of AC line.

(f) Statement of the need for the operator's familiarity with the work platform before it is used.

(11) Alternative configuration statement. When a work platform is designed with alternative configurations:

(a) The manufacturer shall clearly describe these alternatives, including the rated capacity in each situation.

(b) If the rated work load of a platform is the same in any designed configuration, these additional descriptions are not necessary.

(12) Insulation marking. A statement of whether or not the work platform is electrically insulated. If insulated, the level of protection and the applicable test standard shall be stated in accordance with ANSI A92.2-1990.

(13) Maintenance and operating manuals requirement. An operating and maintenance manual(s) shall be provided with each work platform and shall contain:

(a) Descriptions, specifications, and ratings of the work platform, including the data specified in subsection (10) of this section.

(b) The maximum hydraulic and pneumatic systems pressure and the maximum voltage of the electrical systems which are part of the work platform.

(c) Instructions regarding operation and maintenance.

(d) Replacement part(s) information.

(14) Rated load display. The rated work load shall be clearly displayed at each entrance to the work platform.

(15) Management responsibilities.

(a) Employers responsibilities shall be in accordance with ANSI A92.3-1990.

(b) Only trained and authorized personnel shall be permitted to operate the work platform.

(c) Work platforms that are not in safe operating condition shall be removed from service until repaired.

(d) Repairs shall be made by a qualified person in conformance with the manufacturer's operating and maintenance manuals.

(e) Operators shall be trained in care and use before operation, care and use during operation, horizontal relocation, and additional requirements as specified in ANSI A92.3-1990.

(f) Modifications or alterations of work platforms shall be made only with written permission of the manufacturer or any other equivalent entity.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-487, filed 2/13/98, effective 4/15/98.]

WAC 296-155-488 Self propelled elevating work platforms. (1) All applicable rules for design, construction, maintenance, operation, testing and use of self propelled elevating work platforms shall be in accordance with ANSI A92.6-1990.

(2) Minimum rated work load.

(a) The minimum rated work load of work platforms shall not be less than two hundred fifty pounds.

(b) All structural load-supporting elements of the work platform shall have a structural safety factor of not less than two based on the minimum yield strength of the material.

(c) All structural load-supporting elements of the work platform that are made of nonductile material (such as cast iron and fiberglass) shall have a structural safety factor of not less than five based on the minimum ultimate strength of the material.

(d) Design and stability tests shall be in accordance with ANSI A92.6-1990.

(e) Each production unit on level ground shall sustain a load test with a platform load at least one hundred fifty percent of the rated capacity imposed. The test shall include the movement of the platform through its entire range of motion.

(3) Driving interlock.

(a) The unit shall use interlock means that will prevent driving the unit unless the platform height, platform configuration, or any combination of these, are adjusted to meet the stability test requirements.

(b) A work platform limited in driveable height by the interlock means may be elevated and used while stationary up to the maximum platform heights at which it will maintain

stability during the following static test. At the maximum platform height, on level ground, with the platform carrying the rated work load, apply a horizontal test force of one hundred fifty pounds or fifteen percent of the rated platform load (whichever is greater) at the point on the perimeter of the platform most likely to cause overturning.

(4) Platform outrigger interlocks. Where outriggers, stabilizers, or extendable axles are required to meet the side load test, interlocks shall prevent the platform from being raised above the height at which these devices are required unless the required devices are extended. Interlocks shall also prevent the retraction of these devices while the platform is above that level.

(5) Platform requirement.

(a) A guardrail or other structure shall be provided around its upper periphery, which shall be approximately forty-two inches plus or minus three inches in height, a mid-rail, and toeboards which shall be not less than four inches high (nominal dimension). Guardrail and midrail chains, or the equivalent, may be substituted across an access opening. Toeboards may be omitted at the access opening.

(b) The work platform shall have a minimum width of eighteen inches. Proper access shall be provided for personnel to use in reaching the platform deck when it is in the lowered position.

(c) A floor surface shall be provided for both the platform and the access that will minimize slipping.

(6) System safety factors.

(a) When the platform supports its rated work load by a system of wire ropes or chains, or both, the safety factor of the wire rope or chains shall not be less than eight to one, based on ultimate strength.

(b) All critical hydraulic components, all pneumatic components, and all hoses of hydraulic or pneumatic systems shall have a minimum bursting strength of at least four times the operating pressure for which the system is designed.

(c) Noncritical hydraulic components shall have a minimum bursting strength of at least twice the operating pressure for which the system is designed.

(7) Safety design requirements.

(a) Where the elevation of the platform is accomplished by an electromechanical assembly, the system shall be designed to prevent free descent in the event of a generator or power failure.

(b) Where the elevation of the platform is accomplished by a hydraulic or pneumatic cylinder assembly, the system shall be so equipped as to prevent free descent in the event of a hydraulic or pneumatic line failure.

(c) Where the platform is horizontally extendable beyond the base of the machine, the system shall be so equipped as to prevent descent in the event of a hydraulic or pneumatic line failure.

(d) Where the elevation of the platform is accomplished by a single hoist cable, the system shall be protected by a broken-cable safety device that will prevent free descent of the platform.

(e) In addition to the primary operator controls, the work platform shall be equipped with an emergency stop device located at the primary control station that will deactivate all powered functions.

(f) Hydraulically or pneumatically actuated outriggers or stabilizers, or both, shall be designed to prevent their retraction in the event of a hydraulic or pneumatic line failure.

(g) Any work platform equipped with a powered elevating assembly shall be supplied with clearly marked emergency lowering means readily accessible from ground level.

(h) Mechanical power transmission apparatus shall be guarded in accordance with WAC 296-24-205, General safety and health standards.

(8) Directional controls.

(a) Directional controls shall move in the direction of the function they control. The controls shall be of the type that automatically return to the off or the neutral position when released.

(b) Such controls shall be protected against inadvertent operation and shall be clearly marked.

(9) Engine requirement.

(a) Fuel lines of internal-combustion-engine-powered work platforms shall be supported to keep chafing to a minimum. They shall be located to keep exposure to engine and exhaust heat to a minimum.

(b) Liquid fuel lines shall be hard except where flexible connections are required for isolation from vibration.

(c) LP gas fuel systems shall use flexible LP gas hose or hard lines.

(d) Exhaust lines shall be equipped with mufflers. The lines shall be located to minimize the exposure of noise and fumes to operators and personnel near the units.

(10) Each work platform shall be equipped with a mechanical parking brake, which will hold the unit on any slope it is capable of climbing. Wheel chocks shall be installed before using an aerial lift on an incline, provided they can be safely installed.

(11) Specifications display. The following information shall be displayed on all work platforms in a clearly visible, accessible area and in as permanent a manner as possible:

(a) Warnings, cautions, or restrictions for safe operation in accordance with ANSI Z535.2-1991.

(b) Make, model, serial number, and manufacturer's name and address.

(c) Rated work load.

(d) Maximum platform height.

(e) Nominal voltage of the batteries if battery powered.

(f) A notice to study the operating/maintenance manual before using the equipment.

(g) Alternative configuration statement. If a work platform is susceptible to several alternative configurations, then the manufacturer shall clearly describe these alternatives, including the rated capacity in each situation. If the rated work load of a work platform is the same in any configuration, these additional descriptions are not necessary.

(h) A clear statement of whether or not the platform and its enclosure are electrically insulated. If insulated, the level of protection and the applicable test standard shall be stated, in accordance with ANSI 92.2-1990.

(i) The rated work load shall be clearly displayed at each entrance to the platform.

(12) Lift manual requirement. Each work platform shall be provided with an appropriate manual. The manual shall contain:

(a) Descriptions, specifications, and ratings of the work platform, including the data specified in subsection (11)(h) and (i) of this section.

(b) The maximum system pressure and the maximum voltage of the electrical systems that are part of the work platform.

(c) Instructions regarding operation, maintenance, and weld specifications.

(d) Replacement parts information.

(13) Inspection and maintenance.

(a) Each work platform shall be inspected, maintained, repaired and kept in proper working order in accordance with the manufacturer's maintenance and repair manuals.

(b) Any work platform not in safe operating condition shall be removed from service until it is repaired.

(c) All repairs shall be made by a qualified service person in conformance with the manufacturer's maintenance and repair manuals.

(14) Operator requirements. Only trained and authorized personnel shall be permitted to operate the work platform. Before using the work platform, the operator shall:

(a) Read and understand the manufacturer's operating instructions and safety rules, and be trained by a qualified person on the contents of the manufacturer's instructions and safety rules.

(b) Read and understand all decals, warnings, and instructions on the work platform.

(c) On a daily basis, before the work platform is used, it shall be given a thorough inspection, which shall include:

(i) Inspection for defects such as cracked welds, hydraulic leaks, damaged control cable, loose wire connections, and tire damage.

(ii) Inspection of functional controls for proper operation.

(d) Any suspect items discovered through inspection shall be carefully examined and a determination made by a qualified service person as to whether they constitute a safety hazard. All unsafe items shall be corrected before further use of the work platform.

(e) Before the work platform is used, the operator shall survey the area for hazards such as:

(i) Untamped earth fills.

(ii) Ditches.

(iii) Dropoffs or holes.

(iv) Bumps and floor obstructions.

(v) Debris.

(vi) Overhead obstructions and high-voltage conductors.

(vii) Other possible hazardous conditions.

(15) Requirement for operations. The work platform shall be used only in accordance with the Manufacturer's Operating Instructions and Safety Rules, ANSI A92.6-1990, and this standard.

(a) Only trained and authorized personnel shall be permitted to operate the work platform.

(b) Before each elevation of the work platform, the operator shall:

(i) Check for overhead obstructions and high-voltage conductors. A minimum distance of ten feet from energized high-voltage conductors shall be maintained at all times

between the conductors and the operator and platform equipment.

(ii) Ensure that the work platform is elevated only on a firm and level surface.

(iii) Ensure that the load and its distribution on the platform are in accordance with the manufacturer's rated capacity. The manufacturer's recommended load limits shall never be exceeded.

(iv) Ensure that outriggers and stabilizers are used if the manufacturer's instructions require their use.

(v) Ensure that guardrails are properly installed, and gates or openings are closed.

(c) Before and during driving while the platform is elevated, the operator shall:

(i) Be required to look in the direction of, and keep a clear view of, the path of travel and assure that the path of travel is firm and level.

(ii) Maintain a safe distance from obstacles, debris, dropoffs, holes, depressions, ramps, or other hazards to safe elevated travel.

(iii) Maintain a safe distance from overhead obstacles.

(d) The operator shall limit travel speed according to conditions. Conditions to be observed are: Ground surface, congestion, slope, location of personnel, and other factors that may create a hazard of collision or injury to personnel.

(e) Stunt driving and horseplay shall not be permitted.

(f) Personnel shall maintain a firm footing on the platform while working thereon unless they are secured by safety

harness and lanyard devices fixed to manufacturer-approved hard points. Use of railings or planks, ladders or any other device on the work platform for achieving additional height shall be prohibited.

(g) The operator shall immediately report defects or malfunctions which become evident during operation and shall stop use of the work platform until correction has been made.

(h) Altering or disabling of safety devices or interlocks shall be prohibited.

(i) Care shall be taken to prevent ropes, electric cords, hoses, etc., from tangling with the work platform when the platform is being elevated, lowered, or moved.

(j) Work platform rated capacities shall not be exceeded when loads are transferred to the platform at elevated heights.

(k) The operator shall ensure that the area surrounding the work platform is clear of personnel and equipment before lowering the platform.

(16) Fuel tanks shall not be filled while the engine is running. Spillage shall be avoided.

(17) Batteries shall not be charged except in an open, well-ventilated area, free of flame, smoking, spark, or fire.

(18) Modifications. All modifications and alterations to work platforms shall be certified in writing as being in conformance with ANSI A92.6-1990 by the manufacturer or any equivalent entity, such as a nationally recognized testing laboratory.

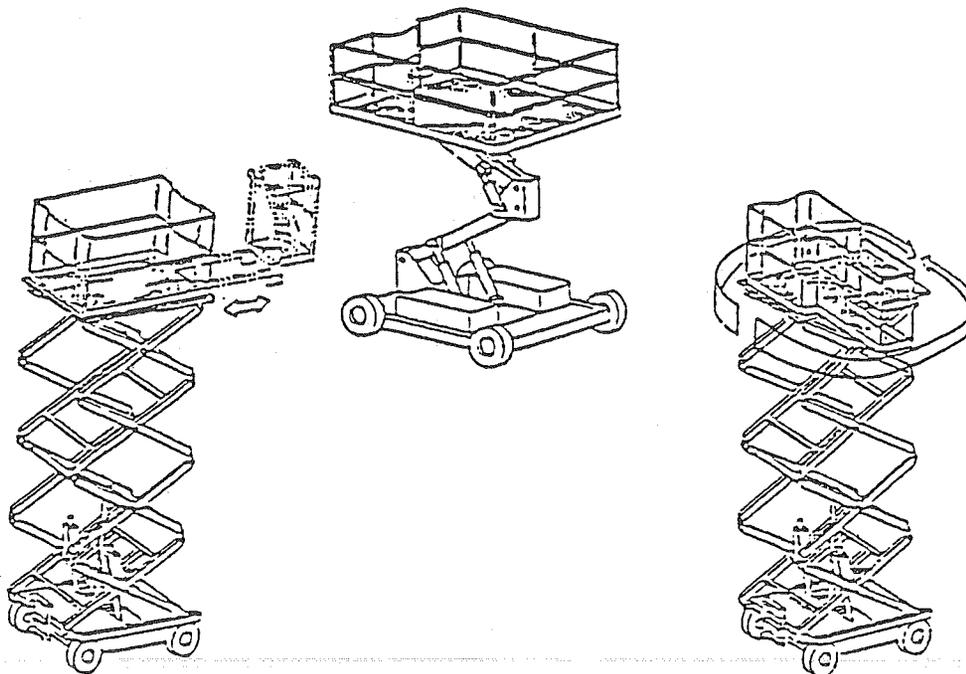


Fig. 1
Examples of Work Platforms

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-488, filed 2/13/98, effective 4/15/98.]

WAC 296-155-489 Boom supported elevating work platforms. (1) All applicable rules for design, construction, maintenance, operation, testing and use of boom supported

elevating work platforms shall be in accordance with ANSI A92.5-1992.

(2) Minimum rated work load. The minimum rated work load of a work platform shall be three hundred pounds. Either single or multiple ratings may be used.

(a) Work platforms with single ratings shall include means which clearly present the rated work load to the operator at the platform control station.

(b) Work platforms having multiple configurations with multiple ratings shall have means which clearly describe the rated work load of each configuration to the operator at the platform control station. Examples of multiple configurations are:

(i) Outriggers extended to firm footing versus outriggers not extended.

(ii) Large platform versus small platform.

(iii) Extendable boom retracted versus extended.

(iv) Boom elevated versus lowered.

(v) Extendable axles extended versus retracted.

(3) Boom angle indicator: When the rated capacity of the alternate configuration depends on the angle the boom makes with the horizontal, the manufacturer shall install means by which that angle can be determined. Such means shall be clearly displayed to the operator at the platform control station.

(4) Structural safety.

(a) All load-supporting structural elements of the work platform shall have a structural safety factor of not less than two to one based on the minimum yield strength of the materials used.

(b) The load-supporting structural elements of the work platform that are made of nonductile material which will not deform plastically before breaking shall have a structural safety factor of not less than five to one based on the minimum ultimate strength of the materials used.

(c) The design stress used in determining the structural safety factor shall be the maximum stresses developed within the element with the machine operating at its rated work load, used in the type of service for which it was designed, and operated in accordance with manufacturer's operation instructions.

(d) The design stress shall include the effects of stress concentration and dynamic loading as shown in ANSI A92.5-1992.

(5) Platform stability.

(a) Each work platform shall be capable of maintaining stability while sustaining a static load equal to one and one-third times its rated work load, concentrated anywhere twelve inches inside the perimeter of the platform, throughout its entire range of motion while on a slope of five degrees from the horizontal in the direction most likely to cause overturning.

(i) If having the outriggers, stabilizers, or extendable axles in contact with the supporting surface is part of the normal configuration to meet the stability requirements, they shall be extended.

(ii) A visual inspection shall be made to determine whether this test has produced an adverse effect on any component.

(b) Each work platform shall sustain on level ground a test load equal to one and one-half times its rated work load throughout the entire range of motion in which the boom can be placed.

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(i) The test load shall be placed with its center of gravity twelve inches inboard from the guardrail while the unit is in the least stable position.

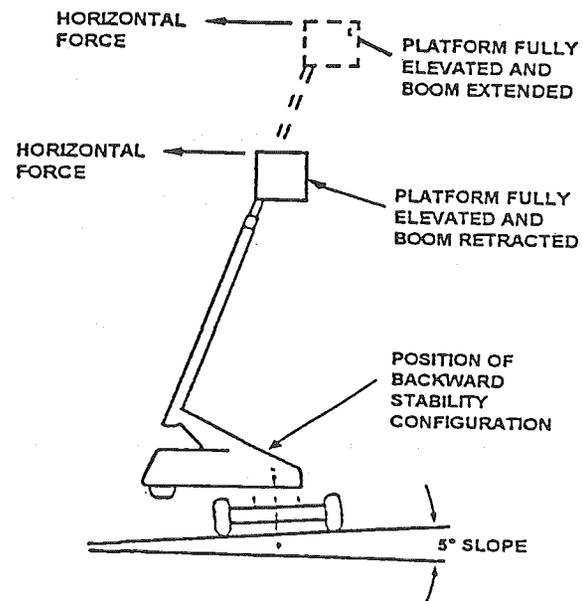
(ii) The work platform shall remain stable during this test.

(iii) A visual inspection shall be made to determine whether this test has produced an adverse effect on any component.

(c) Each work platform shall be capable of maintaining stability when positioned on a five degree slope in its backward stability configuration in the direction and condition most likely to cause overturning, while sustaining a horizontal force of one hundred fifty pounds or fifteen percent of rated capacity, whichever is greater, applied to the upper perimeter of the platform in the direction most likely to cause overturning (see Fig. 1). Note that the most adverse condition may be with zero or with rated work load (concentrated one foot inside perimeter of platform), depending on basket configuration.

(i) If having the outriggers, stabilizers, or extendable axles in contact with the supporting surface is part of the normal configuration to meet stability requirements, they shall be extended.

(ii) A visual inspection shall be made to determine whether this test has produced an adverse effect on any component.



(6) Work platform design requirement. The work platform shall be provided with a guardrail or other structure approximately forty-two inches plus or minus three inches high around its upper periphery, with a midrail, and with toeboards not less than four inches high. Guardrails and midrail chains or the equivalent may be substituted across an access opening.

(a) All stepping, standing, and working surfaces shall be skid resistant.

(b) Attachment points shall be provided for a body belt and lanyard for each person occupying the platform.

(7) Work platform controls. Work platforms shall have both primary and secondary controls.

(a) Primary controls shall be readily accessible to the operator on the platform.

(b) Secondary controls shall be designed to override the primary controls and shall be readily accessible from ground level.

(c) Both primary and secondary controls shall be clearly marked, using permanent legible identification which can be easily understood.

(d) All directional controls shall move in the direction of the function which they control when possible, and shall be of the type which automatically returns to the "off" or the neutral position when released.

(e) Such controls shall be protected against inadvertent operation.

(8) Outrigger interlocks. Where the work platform is equipped with outriggers, stabilizers, or extendable axles, interlocks shall be provided to ensure that the platform cannot be positioned beyond the maximum travel height unless the outriggers, stabilizers, or extendable axles are properly set. Control circuits shall ensure that the driving motor(s) cannot be activated unless the outriggers or stabilizers are disengaged and the platform has been lowered to the maximum travel height (MTH).

(9) Auxiliary operating means: All work platforms shall be provided with an auxiliary means of lowering, retracting, and rotating in the event of primary power loss.

(10) Emergency stop: All work platforms shall be equipped with an emergency stop device, readily accessible to the operator, which will effectively de-energize all powered systems in case of a malfunction.

(11) Tilt alarm: All work platforms shall be fitted with an alarm or other suitable warning at the platform, which will be activated automatically when the machine base is more than five degrees out of level in any direction.

(12) System safety factors.

(a) Where the platform is supporting its rated work load by a system of wire ropes or lift chains, or both, the safety factor of the wire rope or chain shall not be less than eight to one, based on ultimate strength.

(b) All critical components and hoses of hydraulic and pneumatic systems shall have a minimum bursting strength of four times the operating pressure for which the system is designed.

(c) Noncritical components shall have a minimum bursting strength of two times the operating pressure for which the system is designed.

(d) Critical components are defined as those in which a malfunction would result in a free descent of the platform.

(13) Failsafe requirements.

(a) Where the elevation of the platform is accomplished by an electromechanical assembly, the system shall be so designed as to prevent free descent in the event of a generator or power failure.

(b) Where the elevation of the platform is accomplished by a hydraulic or pneumatic cylinder assembly, the system shall be so equipped as to prevent free descent in the event a hydraulic or pneumatic line bursts.

(c) Hydraulically or pneumatically actuated outriggers or stabilizers, or both, shall be so designed as to prevent their retraction in the event a hydraulic or pneumatic line bursts.

(14) Engine requirement.

(a) Fuel lines of internal-combustion-engine-powered work platforms shall be supported to keep chafing to a minimum and located to keep exposure to engine and exhaust heat to a minimum.

(b) Liquid fuel lines shall be hard except where flexible connections are required for isolation from vibration.

(c) LP gas fuel systems shall use flexible LP gas hose or hard lines.

(d) Exhaust lines shall be equipped with mufflers and shall be located to minimize the exposure to noise and fumes of operators and personnel located in the proximity of such units.

(15) Specifications display. There shall be displayed on all work platforms, in a permanent manner, at a readily visible location, the following information:

(a) Special warnings, cautions, or restrictions necessary for safe operation in accordance with ANSI Z535.2-1991.

(b) Make, model, serial number, and manufacturer's name and address.

(c) Rated work load.

(d) Maximum platform height and maximum travel height.

(e) Reference to studying operating instructions in manual before use.

(f) Alternative configuration statement. If a work platform is capable of several alternative configurations and loads, the alternatives shall be clearly described.

(g) A clear statement of whether or not the platform and its enclosure are electrically insulated. If they are electrically insulated, the voltage at which the platform is rated and the applicable test standard shall be stated.

(h) The rated work load shall be clearly displayed at each entrance to the platform and the operator control station.

(16) Lift manual requirements. Each work platform shall be provided with a manufacturer's manual(s) containing the following information:

(a) Descriptions, specifications, and ratings of the work platform, including the data specified in subsection (17) of this section.

(b) The maximum hydraulic operating pressure and the maximum voltage of the electrical systems which are part of the platform.

(c) Instructions regarding operation, safety rules, maintenance, and repair.

(d) Replacement parts information.

(17) Inspection and maintenance.

(a) Each work platform shall be inspected, maintained, repaired, and kept in proper working condition in accordance with the manufacturer's maintenance and repair manuals.

(b) Any work platform found not to be in safe operating condition shall be removed from service until repaired.

(c) All repairs shall be made by a qualified person in conformance with the manufacturer's maintenance and repair manual(s).

(18) Operator requirements. Only trained and authorized persons shall be permitted to operate the work platform. Before using the work platform, the operator shall:

(a) Be instructed by a qualified person in the intended purpose and function of each of the controls.

(b) Read and understand the manufacturer's operating instructions and safety rules, or be trained by a qualified person on the contents of the manufacturer's operating instructions and safety rules.

(c) Understand by reading or by having a qualified person explain all decals, warnings, and instructions displayed on the work platform.

(d) Prior to use on each work shift, the work platform shall be inspected for defects that would affect its safe operation and use. The inspection shall consist of the following:

(i) Visual inspection for cracked welds or other structural defects, hydraulic leaks, damaged control cables, loose wire connections, and tire damage.

(ii) Function test of the operating controls to ensure that they perform their intended functions. Any suspect items shall be carefully examined and a determination made by a qualified person as to whether they constitute a safety hazard. All unsafe items shall be corrected before further use of the work platform.

(iii) Before the work platform is used and during use, the job site shall be checked for hazards such as ditches, dropoffs or holes, bumps and floor obstructions, debris, overhead obstructions and high-voltage conductors, and other possible hazardous conditions.

(19) Requirements for operation. The work platform shall be used only in accordance with the manufacturer's operating instructions and safety rules, ANSI 92.6-1990 and this standard.

(a) Only trained and authorized personnel shall be permitted to operate the work platform.

(b) Before each elevation of the work platform, the operator shall:

(i) Check for overhead obstructions and high-voltage conductors. A minimum distance of ten feet from energized high-voltage conductors shall be maintained at all times between the conductors and the operator and platform equipment.

(ii) Ensure the work platform is elevated only on a firm and level surface.

(iii) Ensure that the load and its distribution on the platform are in accordance with the manufacturer's rated capacity. The manufacturer's rated work load shall never be exceeded.

(iv) Ensure that outriggers or stabilizers are used in accordance with manufacturer's instructions. Wheel chocks shall be installed before using an aerial lift on an incline, provided they can be safely installed.

(v) Ensure that platform guardrails are properly installed and gates or openings are closed.

(vi) Check to see that all occupants' full body harnesses are on and properly attached.

(c) Before and during driving while elevated, the operator shall:

(i) Be required to look in the direction of, and keep a clear view of, the path of travel and make sure that the path is firm and level.

(ii) Maintain a safe distance from obstacles, debris, dropoffs, holes, depressions, ramps, and other hazards to safe elevated travel.

(iii) Maintain a safe distance from overhead obstacles.

(d) Under all travel conditions the operator shall limit speed according to conditions of ground surface, congestion, slope, location of personnel, and other factors which may create a hazard of collision or injury to personnel.

(e) Stunt driving and horseplay shall not be permitted.

(f) Personnel shall maintain a firm footing on the platform while working thereon. Safety harness and lanyard devices fixed to attachment points provided and approved by the manufacturer shall be used by all occupants. Use of railings, planks, ladders, or any other device on the work platform for achieving additional height shall be prohibited.

(g) The operators shall immediately report to their supervisor any defects or malfunctions which become evident during operation. Any defects or malfunctions that affect the safety of operation shall be repaired prior to continued use of the work platform.

(h) Altering, modifying, or disabling safety devices or interlocks is prohibited.

(i) Care shall be taken to prevent ropes, electric cords, hoses, and the like from becoming entangled in the work platform when it is being elevated, lowered, or moved.

(j) Work platform rated capacities shall not be exceeded when live loads are transferred to the platform at elevated heights.

(k) The operator shall ensure that the area surrounding the work platform is clear of personnel and equipment before lowering the platform.

(20) Refueling: Fuel tanks shall not be filled while the engine is running. Caution shall be used while filling tanks to avoid spilling fuel.

(21) Battery charging: Batteries shall not be charged except in an open, well ventilated area free of flame, smoking, spark, and fire.

(22) Modifications: There shall be no modification or alteration to work platforms without the modifications being approved and certified in writing by the manufacturer or other equivalent entity, such as a nationally recognized testing laboratory, to be in conformance with all applicable provisions of ANSI A92.5-1992 and this standard.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-489, filed 2/13/98, effective 4/15/98.]

WAC 296-155-490 Aerial lifts. (1) "General requirements."

(a) Unless otherwise provided in this section, aerial lifts acquired for use on or after January 22, 1973, shall be designed and constructed in conformance with the applicable requirements of the American National Standards for "Vehicle Mounted Elevating and Rotating Work Platforms," ANSI A92.2-1969, including appendix. Aerial lifts acquired before January 22, 1973, which do not meet the requirements of ANSI A92.2-1969, may not be used after January 1, 1976, unless they shall have been modified so as to conform with

the applicable design and construction requirements of ANSI A92.2-1969. Aerial lifts include the following types of vehicle-mounted aerial devices used to elevate personnel to job-sites above ground:

- (i) Extensible boom platforms;
- (ii) Aerial ladders;
- (iii) Articulating boom platforms;
- (iv) Vertical towers; and

(v) A combination of any such devices. Aerial equipment may be made of metal, wood, fiberglass reinforced plastic (FRP), or other material; may be powered or manually operated; and are deemed to be aerial lifts whether or not they are capable of rotating about a substantially vertical axis.

(b) Aerial lifts may be "field modified" for uses other than those intended by the manufacturer provided the modification has been certified in writing by the manufacturer or by any other equivalent entity, such as a nationally recognized testing laboratory, to be in conformity with all applicable provisions of ANSI A92.2-1969 and this section and to be at least as safe as the equipment was before modification.

(2) "Specific requirements."

(a) Ladder trucks and tower trucks:

(i) Aerial ladders shall be secured in the lower traveling position by the locking device on top of the truck cab, and the manually operated device at the base of the ladder before the truck is moved for highway travel.

(ii) A full body harness shall be worn and a lanyard attached to the ladder rail or tower when working from ladder trucks or tower trucks.

(b) Extensible and articulating boom platforms.

(i) Lift controls shall be tested each day prior to use to determine that such controls are in safe working condition.

(ii) Only authorized persons shall operate an aerial lift.

(iii) Belting off to an adjacent pole, structure, or equipment while working from an aerial lift shall not be permitted.

(iv) Employees shall always stand firmly on the floor of the basket, and shall not sit or climb on the edge of the basket or use planks, ladders, or other devices for a work position.

(v) A full body harness shall be worn and a lanyard attached to the boom or basket when working from an aerial lift.

(vi) Boom and basket load limits specified by the manufacturer shall not be exceeded.

(vii) The brakes shall be set and when outriggers are used, they shall be positioned on pads or a solid surface. Wheel chocks shall be installed before using an aerial lift on an incline, provided they can be safely installed.

(viii) An aerial lift truck shall not be moved when the boom is elevated in a working position with men in the basket, except for equipment which is specifically designed for this type of operation in accordance with the provisions of subsection (1)(a) and (b) of this section.

(ix) Articulating boom and extensible boom platforms, primarily designed as personnel carriers, shall have both platform (upper) and lower controls. Upper controls shall be in or beside the platform within easy reach of the operator. Lower controls shall provide for overriding the upper controls. Controls shall be plainly marked as to their function. Lower level controls shall not be operated unless permission has been

obtained from the employee in the lift, except in case of emergency.

(x) Climbers shall not be worn while performing work from an aerial lift.

(xi) The insulated portion of an aerial lift shall not be altered in any manner that might reduce its insulating value.

(xii) Before moving an aerial lift for travel, the boom(s) shall be inspected to see that it is properly cradled and outriggers are in stowed position except as provided in (b)(viii) of this subsection.

(c) Electrical tests. All electrical tests shall conform to the requirements of ANSI A92.2-1990 section 5. However equivalent d.c. voltage tests may be used in lieu of the a.c. voltage specified in A92.2-1990; d.c. voltage tests which are approved by the equipment manufacturer or equivalent entity shall be considered an equivalent test for the purpose of this subsection (2)(c).

(d) Bursting safety factor. The provisions of the American National Standards Institute standard ANSI A92.2-1990, section 4.9 Bursting Safety Factor shall apply to all critical hydraulic and pneumatic components. Critical components are those in which a failure would result in a free fall or free rotation of the boom. All noncritical components shall have a bursting safety factor of at least 2 to 1.

(e) Welding standards. All welding shall conform to the following standards as applicable:

(i) Standard Qualification Procedure, AWS B3.0-41.

(ii) Recommended Practices for Automotive Welding Design, AWS D8.4-61.

Note: Nonmandatory Appendix C to this part lists examples of national consensus standards that are considered to provide employee protection equivalent to that provided through the application of ANSI A92.2-1990, where appropriate. Copies may be obtained from the American National Standards Institute.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-490, filed 2/13/98, effective 4/15/98.]

WAC 296-155-493 Training. This section supplements and clarifies the requirements of WAC 296-155-100 (1)(c) and 296-155-110 (3)(g) as these relate to the hazards of work on scaffolds.

(1) The employer shall have each employee who performs work while on a scaffold trained by a person qualified in the subject matter to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards. The training shall include the following areas, as applicable:

(a) The nature of any electrical hazards, fall hazards and falling object hazards in the work area;

(b) The correct procedures for dealing with electrical hazards and for erecting, maintaining, and disassembling the fall protection systems and falling object protection systems being used;

(c) The proper use of the scaffold, and the proper handling of materials on the scaffold;

(d) The maximum intended load and the load-carrying capacities of the scaffolds used; and

(e) Any other pertinent requirements of this subpart.

(2) The employer shall have each employee who is involved in erecting, disassembling, moving, operating,

repairing, maintaining, or inspecting a scaffold trained by a competent person to recognize any hazards associated with the work in question. The training shall include the following topics, as applicable:

- (a) The nature of scaffold hazards;
 - (b) The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold in question;
 - (c) The design criteria, maximum intended load-carrying capacity and intended use of the scaffold;
 - (d) Any other pertinent requirements of this subpart.
- (3) When the employer has reason to believe that an employee lacks the skill or understanding needed for safe work involving the erection, use or dismantling of scaffolds, the employer shall retrain each such employee so that the requisite proficiency is regained. Retraining is required in at least the following situations:
- (a) Where changes at the worksite present a hazard about which an employee has not been previously trained; or
 - (b) Where changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard about which an employee has not been previously trained; or
 - (c) Where inadequacies in an affected employee's work involving scaffolds indicate that the employee has not retained the requisite proficiency.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-493, filed 2/13/98, effective 4/15/98.]

WAC 296-155-494 Non-Mandatory Appendix A to Part J-1, Scaffold Specifications. This Appendix provides non-mandatory guidelines to assist employers in complying with the requirements of Part J-1 of this chapter. An employer may use these guidelines and tables as a starting point for designing scaffold systems. However, the guidelines do not provide all the information necessary to build a complete system, and the employer is still responsible for designing and assembling these components in such a way that the completed system will meet the requirements of WAC 296-155-483(1). Scaffold components which are not selected and loaded in accordance with this Appendix, and components for which no specific guidelines or tables are given in this Appendix (e.g., joints, ties, components for wood pole scaffolds more than 60 feet in height, components for heavy-duty horse scaffolds, components made with other materials, and components with other dimensions, etc.) must be designed and constructed in accordance with the capacity requirements of WAC 296-155-483(1), and loaded in accordance with WAC 296-155-483 (4)(a).

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- 2. Specific guidelines and tables.
 - (a) Pole scaffolds:
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 - (e) Bricklayers' square scaffolds.

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- (f) Horse scaffolds.
- (g) Form scaffolds and carpenters' bracket scaffolds.
- (h) Roof bracket scaffolds.
- (i) Outrigger scaffolds (one level).
- (j) Pump jack scaffolds.
- (k) Ladder jack scaffolds.
- (l) Window jack scaffolds.
- (m) Crawling boards (chicken ladders).
- (n) Step, platform and trestle ladder scaffolds.
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- (s) Float (ship) scaffolds.
- (t) Interior hung scaffolds.
- (u) Needle beam scaffolds.
- (v) Multilevel suspension scaffolds.
- (w) Mobile scaffolds.
- (x) Repair bracket scaffolds.
- (y) Stilts.
- (z) Tank builders' scaffolds.

1. General guidelines and tables.

(a) The following tables, and the tables in Part 2 — Specific guidelines and tables, assume that all load-carrying timber members (except planks) of the scaffold are a minimum of 1,500 lb-f/in(2) (stress grade) construction grade lumber. All dimensions are nominal sizes as provided in the American Softwood Lumber Standards, dated January 1970, except that, where rough sizes are noted, only rough or undressed lumber of the size specified will satisfy minimum requirements.

(b) Solid sawn wood used as scaffold planks shall be selected for such use following the grading rules established by a recognized lumber grading association or by an independent lumber grading inspection agency. Such planks shall be identified by the grade stamp of such association or agency. The association or agency and the grading rules under which the wood is graded shall be certified by the Board of Review, American Lumber Standard Committee, as set forth in the American Softwood Lumber Standard of the U.S. Department of Commerce.

(i) Allowable spans shall be determined in compliance with the National Design Specification for Wood Construction published by the National Forest Products Association; paragraph 5 of ANSI A10.8-1988 Scaffolding-Safety Requirements published by the American National Standards Institute; or for 2 x 10 inch (nominal) or 2 x 9 inch (rough) solid sawn wood planks, as shown in the following table:

Maximum intended nominal load (lb/ft ²)	Maximum permissible span using full thickness undressed lumber (ft)	Maximum permissible span using nominal thickness lumber (ft)
25	10	8
50	8	6
75	6	

(ii) The maximum permissible span for 1 1/4 x 9-inch or wider wood plank of full thickness with a maximum intended load of 50 lb/ft.(2) shall be 4 feet.

(c) Fabricated planks and platforms may be used in lieu of solid sawn wood planks. Maximum spans for such units shall be as recommended by the manufacturer based on the maximum intended load being calculated as follows:

Rated load capacity	Intended load
Light-duty	*25 pounds per square foot applied uniformly over the entire span area.
Medium-duty	*50 pounds per square foot applied uniformly over the entire span area.
Heavy-duty	*75 pounds per square foot applied uniformly over the entire span area.
One-person	*250 pounds placed at the center of the span (total 250 pounds).
Two-person	*250 pounds placed 18 inches to the left and right of the center of the span (total 500 pounds).
Three-person	*250 pounds placed at the center of the span and 250 pounds placed 18 inches to the left and right of the center of the span (total 750 pounds).

Note: Platform units used to make scaffold platforms intended for light-duty use shall be capable of supporting at least 25 pounds per square foot applied uniformly over the entire unit-span area, or a 250-pound point load placed on the unit at the center of the span, whichever load produces the greater shear force.

(d) Guardrails shall be as follows:

(i) Toprails shall be equivalent in strength to 2 inch by 4 inch lumber; or

1 1/4 inch x 1/8 inch structural angle iron; or
1 inch x .070 inch wall steel tubing; or 1.990 inch x .058 inch wall aluminum tubing.

(ii) Midrails shall be equivalent in strength to 1 inch by 6 inch lumber; or

1 1/4 inch x 1 1/4 inch x 1/8 inch structural angle iron; or
1 inch x .070 inch wall steel tubing; or
1.990 inch x .058 inch wall aluminum tubing.

(iii) Toeboards shall be equivalent in strength to 1 inch by 4 inch lumber; or

1 1/4 inch x 1 1/4 inch structural angle iron; or
1 inch x .070 inch wall steel tubing; or
1.990 inch x .058 inch wall aluminum tubing.

(iv) Posts shall be equivalent in strength to 2 inch by 4 inch lumber; or

1 1/4 inch x 1 1/4 inch x 1/8 structural angle iron; or
1 inch x .070 inch wall steel tubing; or
1.990 inch x .058 inch wall aluminum tubing.

(v) Distance between posts shall not exceed 8 feet.

(e) Overhead protection shall consist of 2 inch nominal planking laid tight, or 3/4-inch plywood.

(f) Screen installed between toeboards and midrails or top rails shall consist of No. 18 gauge U.S. Standard wire one inch mesh.

2. Specific guidelines and tables.

(a) Pole Scaffolds.

Single Pole Wood Pole Scaffolds

	Light duty up to 20 feet high	Light duty up to 60 feet high	Medium duty up to 60 feet high	Heavy duty up to 60 feet high
Maximum intended load (lbs/ft ²)	25	25	50	75
Poles or uprights	2 x 4 in.	4 x 4 in.	4 x 4 in.	4 x 6 in.
Maximum pole spacing (longitudinal)	6 feet	10 feet	8 feet	6 feet
Maximum pole spacing (transverse)	5 feet	5 feet	5 feet	5 feet
Runners	1 x 4 in.	1 1/4 x 9 in.	2 x 10 in.	2 x 10 in.
Bearers and maximum spacing of bearers:				
3 feet	2 x 4 in.	2 x 4 in.	2 x 10 in. or 3 x 4 in.	2 x 10 in. or 3 x 5 in.
5 feet	2 x 6 in. or 3 x 4 in.	2 x 6 in. or 3 x 4 in. (rough)	2 x 10 in. or 3 x 4 in.	2 x 10 in. or 3 x 5 in.
6 feet . . . . .	. . . . .	. . . . .	2 x 10 in. or 3 x 4 in.	2 x 10 in. or 3 x 5 in.
8 feet . . . . .	. . . . .	. . . . .	2 x 10 in. or 3 x 4 in.	
Planking	1 1/4 x 9 in.	2 x 10 in.	2 x 10 in.	2 x 10 in.

Single Pole Wood Pole Scaffolds

	Light duty up to 20 feet high	Light duty up to 60 feet high	Medium duty up to 60 feet high	Heavy duty up to 60 feet high
Maximum vertical spacing of horizontal members	7 feet	9 feet	7 feet	6 ft. 6 in.
Bracing horizontal	1 x 4 in.	1 x 4 in.	1 x 6 in. or 1 1/4 x 4 in.	2 x 4 in.
Bracing diagonal	1 x 4 in.	1 x 4 in.	1 x 4 in.	2 x 4 in.
Tie-ins	1 x 4 in.	1 x 4 in.	1 x 4 in.	1 x 4 in.

Note: All members except planking are used on edge. All wood bearers shall be reinforced with 3/16 x 2 inch steel strip, or the equivalent, secured to the lower edges for the entire length of the bearer.

Independent Wood Pole Scaffolds

	Light duty up to 20 feet high	Light duty up to 60 feet high	Medium duty up to 60 feet high	Heavy duty up to 60 feet high
Maximum intended load	25 lbs/ft ²	25 lbs/ft ²	50 lbs/ft ²	75 lbs/ft ²
Poles or uprights	2 x 4 in.	4 x 4 in.	4 x 4 in.	4 x 4 in.
Maximum pole spacing (longitudinal)	6 feet	10 feet	8 feet	6 feet.
Maximum (transverse)	6 feet	10 feet	8 feet	8 feet.
Runners	1 1/4 x 4 in	1 1/4 x 9 in	2 x 10 in.	2 x 10 in.
Bearers and maximum spacing of bearers:				
3 feet	2 x 4 in.	2 x 4 in.	2 x 10 in. (rough).	2 x 10 in.
6 feet	2 x 6 in. or 3 x 4 in.	2 x 10 in. (rough) or 3 x 8 in.	2 x 10 in.	2 x 10 in. (rough)
8 feet	2 x 6 in. or 3 x 4 in.	2 x 10 in. (rough) or 3 x 8 in.	2 x 10 in.	
10 feet	2 x 6 in. or 3 x 4 in.	2 x 10 in. (rough) or 3 x 3 in.		
Planking	1 1/4 x 9 in.	2 x 10 in.	2 x 10 in.	2 x 10 in.
Maximum vertical spacing of horizontal members	7 feet	7 feet	6 feet	6 feet.
Bracing horizontal	1 x 4 in.	1 x 4 in.	1 x 6 in. or 1 1/4 x 4 in.	2 x 4 in.
Bracing diagonal	1 x 4 in.	1 x 4 in.	1 x 4 in.	2 x 4 in.
Tie-ins	1 x 4 in.	1 x 4 in.	1 x 4 in.	1 x 4 in.

Note: All members except planking are used on edge. All wood bearers shall be reinforced with 3/16 x 2 inch steel strip, or the equivalent, secured to the lower edges for the entire length of the bearer.

(b) Tube and coupler scaffolds.

Minimum Size of Members

	Light duty	Medium duty	Heavy duty
Maximum intended load	25 lbs/ft ²	50 lbs/ft ²	75 lbs/ft ²

Minimum Size of Members

	Light duty	Medium duty	Heavy duty
Posts, runners and braces . . .	Nominal 2 in. (1.90 inches) OD steel tube or pipe.	Nominal 2 in. (1.90 inches) OD steel tube or pipe.	Nominal 2 in. (1.90 inches) OD steel tube or pipe.
Bearers	Nominal 2 in. (1.90 inches) OD steel tube or pipe and a maximum post spacing of 4 ft. x 10 ft.	Nominal 2 in. (1.90 inches) OD steel tube or pipe and a maximum post spacing of 4 ft. x 7 ft. or Nominal 2 1/2 in. (2.375 in.) OD steel tube or pipe and a maximum post spacing of 6 ft. x 8 ft. (*)	Nominal 2 1/2 in. (2.375 in.) OD steel tube or pipe and a maximum post spacing of 6 ft. x 6 ft.
Maximum runner spacing vertically	6 ft. 6 in.	6 ft. 6 in.	6 ft. 6 in.

(*) Bearers shall be installed in the direction of the shorter dimension.

Note: Longitudinal diagonal bracing shall be installed at an angle of 45 deg. (+/- 5 deg.).

Maximum Number of Planked Levels

Number of Working Levels:	Maximum number of additional planked levels			Maximum height of scaffold (in feet)
	Light duty	Medium duty	Heavy duty	
1	16	11	6	125
2	11	1	0	125
3	6	0	0	125
4	1	0	0	125

(c) "Fabricated frame scaffolds." Because of their pre-fabricated nature, no additional guidelines or tables for these scaffolds are being adopted in this Appendix.

(d) "Plasterers', decorators', and large area scaffolds." The guidelines for pole scaffolds or tube and coupler scaffolds (Appendix A (a) and (b)) may be applied.

(e) "Bricklayers' square scaffolds."

Maximum intended load: 50 lb/ft. (2)(*)

Footnote (*) The squares shall be set not more than 8 feet apart for light duty scaffolds and not more than 5 feet apart for medium duty scaffolds.

Maximum width: 5 ft.

Maximum height: 5 ft.

Gussets: 1 x 6 in.

Braces: 1 x 8 in.

Legs: 2 x 6 in.

Bearers (horizontal members): 2 x 6 in.

(f) Horse scaffolds.

Maximum intended load (light duty): 25 lb/ft. (2)(**)

Footnote (**) Horses shall be spaced not more than 8 feet apart for light duty loads, and not more than 5 feet apart for medium duty loads.

Maximum intended load (medium duty): 50 lb/ft. (2)(**)

Footnote (**) Horses shall be spaced not more than 8 feet apart for light duty loads, and not more than 5 feet apart for medium duty loads.

Horizontal members or bearers:

Light duty: 2 x 4 in.

Medium duty: 3 x 4 in.

Legs: 2 x 4 in.

Longitudinal brace between legs: 1 x 6 in.

Gusset brace at top of legs: 1 x 8 in.

Half diagonal braces: 2 x 4 in.

(g) "Form scaffolds and carpenters' bracket scaffolds."

(1) Brackets shall consist of a triangular-shaped frame made of wood with a cross-section not less than 2 inches by 3 inches, or of 1 1/4 inch x 1 1/4 inch x 1/8 inch structural angle iron.

(2) Bolts used to attach brackets to structures shall not be less than 5/8 inches in diameter.

(3) Maximum bracket spacing shall be 8 feet on centers.

(4) No more than two employees shall occupy any given 8 feet of a bracket or form scaffold at any one time. Tools and materials shall not exceed 75 pounds in addition to the occupancy.

(5) Wooden figure-four scaffolds:

Maximum intended load: 25 lb/ft.(2)

Uprights: 2 x 4 in. or 2 x 6 in.

Bearers (two): 1 x 6 in.

Braces: 1 x 6 in.

Maximum length of bearers (unsupported): 3 ft. 6 in.

(i) Outrigger bearers shall consist of two pieces of 1 x 6 inch lumber nailed on opposite sides of the vertical support.

(ii) Bearers for wood figure-four brackets shall project not more than 3 feet 6 inches from the outside of the form support, and shall be braced and secured to prevent tipping or turning. The knee or angle brace shall intersect the bearer at least 3 feet from the form at an angle of approximately 45

degrees, and the lower end shall be nailed to a vertical support.

- (6) Metal bracket scaffolds:
Maximum intended load: 25 lb/ft.(2)
Uprights: 2 x 4 inch
Bearers: As designed.
Braces: As designed.

- (7) Wood bracket scaffolds:
Maximum intended load: 25 lb/ft.(2)
Uprights: 2 x 4 in. or 2 x 6 in.
Bearers: 2 x 6 in.
Maximum scaffold width: 3 ft 6 in.
Braces: 1 x 6 in.

(h) "Roof bracket scaffolds." No specific guidelines or tables are given.

(i) "Outrigger scaffolds (single level)." No specific guidelines or tables are given.

(j) "Pump jack scaffolds." Wood poles shall not exceed 30 feet in height. Maximum intended load — 500 lbs between poles; applied at the center of the span. Not more than two employees shall be on a pump jack scaffold at one time between any two supports. When 2 x 4's are spliced together to make a 4 x 4 inch wood pole, they shall be spliced with "10 penny" common nails no more than 12 inches center to center, staggered uniformly from the opposite outside edges.

(k) "Ladder jack scaffolds." Maximum intended load — 25 lb/ft(2). However, not more than two employees shall occupy any platform at any one time. Maximum span between supports shall be 8 feet.

(l) "Window jack scaffolds." Not more than one employee shall occupy a window jack scaffold at any one time.

(m) "Crawling boards (chicken ladders)." Crawling boards shall be not less than 10 inches wide and 1 inch thick, with cleats having a minimum 1 x 1 1/2 inch cross-sectional area. The cleats shall be equal in length to the width of the board and spaced at equal intervals not to exceed 24 inches.

(n) "Step, platform, and trestle ladder scaffolds." No additional guidelines or tables are given.

(o) "Single-point adjustable suspension scaffolds." Maximum intended load — 250 lbs. Wood seats for boatswains' chairs shall be not less than 1 inch thick if made of nonlaminated wood, or 5/8 inches thick if made of marine quality plywood.

(p) "Two-point adjustable suspension scaffolds."

(1) In addition to direct connections to buildings (except window cleaners' anchors) acceptable ways to prevent scaffold sway include angulated roping and static lines. Angulated roping is a system of platform suspension in which the upper wire rope sheaves or suspension points are closer to the plane of the building face than the corresponding attachment points on the platform, thus causing the platform to press against the face of the building. Static lines are separate ropes secured at their top and bottom ends closer to the plane of the building face than the outermost edge of the platform. By drawing the static line taut, the platform is drawn against the face of the building.

(2) On suspension scaffolds designed for a working load of 500 pounds, no more than two employees shall be permitted on the scaffold at one time. On suspension scaffolds with a working load of 750 pounds, no more than three employees shall be permitted on the scaffold at one time.

(3) Ladder-type platforms. The side stringer shall be of clear straight-grained spruce. The rungs shall be of straight-grained oak, ash, or hickory, at least 1 1/8 inches in diameter, with 7/8 inch tenons mortised into the side stringers at least 7/8 inch. The stringers shall be tied together with tie rods not less than 1/4 inch in diameter, passing through the stringers and riveted up tight against washers on both ends. The flooring strips shall be spaced not more than 5/8 inch apart, except at the side rails where the space may be 1 inch. Ladder-type platforms shall be constructed in accordance with the following table:

Schedule for Ladder-Type Platforms

Length of Platform	12 feet	14 & 16 feet	18 & 20 feet
Side stringers, minimum cross section (finished sizes):			
At ends	1 3/4 x 2 3/4 in.	1 3/4 x 2 3/4 in.	1 3/4 x 3 in.
At middle	1 3/4 x 3 3/4 in.	1 3/4 x 3 3/4 in.	1 3/4 x 4 in.
Reinforcing strip (minimum)	A 1/8 x 7/8 inch steel reinforcing strip shall be attached to the side or underside, full length.		
Rungs	Rungs shall be 1 1/8 inch minimum diameter with at least 7/8 inch in diameter tenons, and the maximum spacing shall be 12 inches to center.		
Tie rods:			
Number (minimum)	3	4	4
Diameter (minimum)	1/4 inch	1/4 inch	1/4 inch
Flooring, minimum finished size	1/2 x 2 3/4 in.	1/2 x 2 3/4 in.	1/2 x 2 3/4 in.

Schedule for Ladder-Type Platforms		
Length of Platform	22 & 24 ft.	28 & 30 ft.
Side stringers, minimum cross section (finished sizes):		
At ends	1 3/4 x 3 in.	1 3/4 x 3 1/2 in.
At middle	1 3/4 x 4 1/4 in.	1 3/4 x 5 in.
Reinforcing strip (minimum)	A 1/8 x 7/8 inch steel reinforcing strip shall be attached to the side or underside, full length.	
Rungs	Rungs shall be 1 1/8 inch minimum diameter with at least 7/8 inch in diameter tenons, and the maximum spacing shall be 12 inches to center.	
Tie rods:		
Number (minimum)	5	6
Diameter (minimum)	1/4 in.	1/4 in.
Flooring, minimum finished size	1/2 x 2 3/4 in.	1/2 x 2 3/4 in.

(4) Plank-Type Platforms. Plank-type platforms shall be composed of not less than nominal 2 x 8 inch unspliced planks, connected together on the underside with cleats at intervals not exceeding 4 feet, starting 6 inches from each end. A bar or other effective means shall be securely fastened to the platform at each end to prevent the platform from slipping off the hanger. The span between hangers for plank-type platforms shall not exceed 10 feet.

(5) Beam-Type Platforms. Beam platforms shall have side stringers of lumber not less than 2 x 6 inches set on edge. The span between hangers shall not exceed 12 feet when beam platforms are used. The flooring shall be supported on 2 x 6 inch cross beams, laid flat and set into the upper edge of the stringers with a snug fit, at intervals of not more than 4 feet, securely nailed to the cross beams. Floor-boards shall not be spaced more than 1/2 inch apart.

(q)(1) "Multipoint adjustable suspension scaffolds and stonemasons' multipoint adjustable suspension scaffolds." No specific guidelines or tables are given for these scaffolds.

(q)(2) "Masons' multipoint adjustable suspension scaffolds." Maximum intended load—50 lb/ft(2). Each outrigger beam shall be at least a standard 7 inch, 15.3 pound steel I-beam, at least 15 feet long. Such beams shall not project more than 6 feet 6 inches beyond the bearing point. Where the overhang exceeds 6 feet 6 inches, outrigger beams shall be composed of stronger beams or multiple beams.

(r) "Catenary scaffolds."

(1) Maximum intended load — 500 lbs.

(2) Not more than two employees shall be permitted on the scaffold at one time.

(3) Maximum capacity of come-along shall be 2,000 lbs.

(4) Vertical pickups shall be spaced not more than 50 feet apart.

(5) Ropes shall be equivalent in strength to at least 1/2 inch (1.3 cm) diameter improved plow steel wire rope.

(s) "Float (ship) scaffolds."

(1) Maximum intended load — 750 lbs.

(2) Platforms shall be made of 3/4 inch plywood, equivalent in rating to American Plywood Association Grade B-B, Group I, Exterior.

(3) Bearers shall be made from 2 x 4 inch, or 1 x 10 inch rough lumber. They shall be free of knots and other flaws.

(4) Ropes shall be equivalent in strength to at least 1 inch (2.5 cm) diameter first grade manila rope.

(t) Interior hung scaffolds.

Bearers (use on edge): 2 x 10 in.

Maximum intended load: Maximum span 25 lb/ft. (2): 10 ft.

50 lb/ft. (2): 10 ft.

75 lb/ft. (2): 7 ft.

(u) "Needle beam scaffolds."

Maximum intended load: 25 lb/ft. (2)

Beams: 4 x 6 in.

Maximum platform span: 8 ft.

Maximum beam span: 10 ft.

(1) Ropes shall be attached to the needle beams by a scaffold hitch or an eye splice. The loose end of the rope shall be tied by a bowline knot or by a round turn and a half hitch.

(2) Ropes shall be equivalent in strength to at least 1 inch (2.5 cm) diameter first grade manila rope.

(v) "Multilevel suspension scaffolds." No additional guidelines or tables are being given for these scaffolds.

(w) "Mobile Scaffolds." Stability test as described in the ANSI A92 series documents, as appropriate for the type of scaffold, can be used to establish stability for the purpose of WAC 296-155-484 (23)(f)(ii).

(x) "Repair bracket scaffolds." No additional guidelines or tables are being given for these scaffolds.

(y) "Stilts." No specific guidelines or tables are given.

(z) "Tank builder's scaffold."

(1) The maximum distance between brackets to which scaffolding and guardrail supports are attached shall be no more than 10 feet 6 inches.

(2) Not more than three employees shall occupy a 10 feet 6 inch span of scaffold planking at any time.

(3) A taut wire or synthetic rope supported on the scaffold brackets shall be installed at the scaffold plank level between the innermost edge of the scaffold platform and the curved plate structure of the tank shell to serve as a safety line in lieu of an inner guardrail assembly where the space between the scaffold platform and the tank exceeds 12 inches (30.48 cm). In the event the open space on either side of the rope exceeds 12 inches (30.48 cm), a second wire or synthetic rope appropriately placed, or guardrails in accordance with WAC 296-155-483 (7)(d), shall be installed in order to reduce that open space to less than 12 inches (30.48 cm).

(4) Scaffold planks of rough full-dimensioned 2-inch (5.1 cm) x 12-inch (30.5 cm) Douglas Fir or Southern Yellow

Pine of Select Structural Grade shall be used. Douglas Fir planks shall have a fiber stress of at least 1900 lb/in(2) (130,929 n/cm(2)) and a modulus of elasticity of at least 1,900,000 lb/in(2) (130,929,000 n/cm(2)), while Yellow Pine planks shall have a fiber stress of at least 2500 lb/in(2) (172,275 n/cm(2)) and a modulus of elasticity of at least 2,000,000 lb/in(2) (137,820,000 n/cm(2)).

(5) Guardrails shall be constructed of a taut wire or synthetic rope, and shall be supported by angle irons attached to brackets welded to the steel plates. These guardrails shall comply with WAC 296-155-483 (7)(d) guardrail supports shall be located at no greater than 10 feet 6 inch intervals.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-494, filed 2/13/98, effective 4/15/98.]

WAC 296-155-496 Non-Mandatory Appendix C to Part J-1, List of National Consensus Standards. ANSI/SIA A92.2-1990 Vehicle-Mounted Elevating and Rotating Aerial Devices

ANSI/SIA A92.3-1990 Manually Propelled Elevating Aerial Platforms

ANSI/SIA A92.5-1990 Boom Supported Elevating Work Platforms

ANSI/SIA A92.6-1990 Self-Propelled Elevating Work Platforms

ANSI/SIA A92.7-1990 Airline Ground Support Vehicle-Mounted Vertical Lift Devices

ANSI/SIA A92.8-1993 Vehicle-Mounted Bridge Inspection and Maintenance Devices

ANSI/SIA A92.9-1993 Mast-Climbing Work Platforms

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-496, filed 2/13/98, effective 4/15/98.]

WAC 296-155-497 Non-Mandatory Appendix D to Part J-1, List of Training Topics for Scaffold Erectors and Dismantlers. This Appendix D is provided to serve as a guide to assist employers when evaluating the training needs of employees erecting or dismantling supported scaffolds. The Agency believes that employees erecting or dismantling scaffolds should be trained in the following topics:

- *General Overview of Scaffolding
 - * regulations and standards
 - * erection/dismantling planning
 - * PPE and proper procedures
 - * fall protection
 - * materials handling
 - * access
 - * working platforms
 - * foundations
 - * guys, ties and braces
- *Tubular Welded Frame Scaffolds
 - * specific regulations and standards
 - * components
 - * parts inspection
 - * erection/dismantling planning
 - * guys, ties and braces
 - * fall protection
 - * general safety
 - * access and platforms
 - * erection/dismantling procedures

- * rolling scaffold assembly
- * putlogs
- *Tube and Clamp Scaffolds
 - * specific regulations and standards
 - * components
 - * parts inspection
 - * erection/dismantling planning
 - * guys, ties and braces
 - * fall protection
 - * general safety
 - * access and platforms
 - * erection/dismantling procedures
 - * buttresses, cantilevers, & bridges
- *System Scaffolds
 - * specific regulations and standards
 - * components
 - * parts inspection
 - * erection/dismantling planning
 - * guys, ties and braces
 - * fall protection
 - * general safety
 - * access and platforms
 - * erection/dismantling procedures
 - * buttresses, cantilevers, & bridges

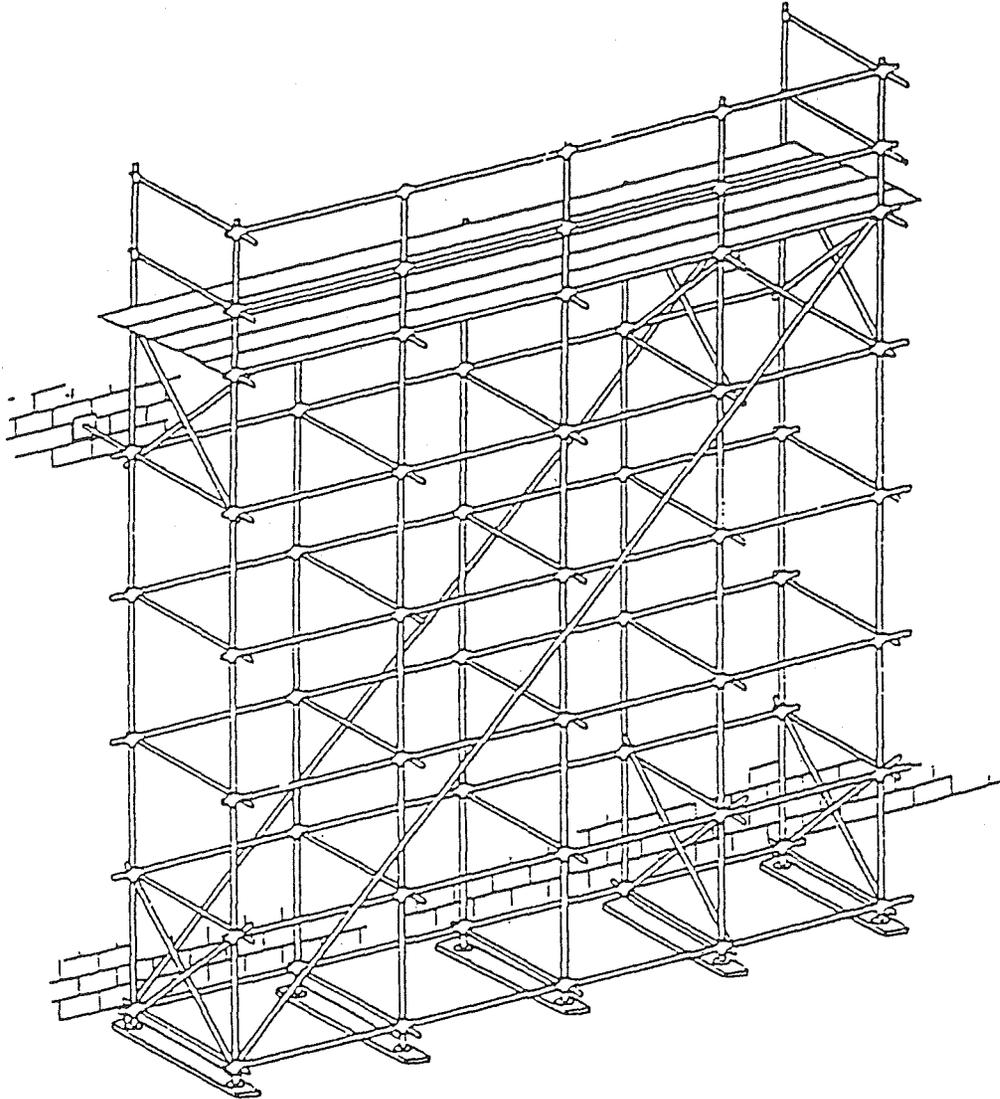
Scaffold erectors and dismantlers should all receive the general overview, and, in addition, specific training for the type of supported scaffold being erected or dismantled.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-497, filed 2/13/98, effective 4/15/98.]

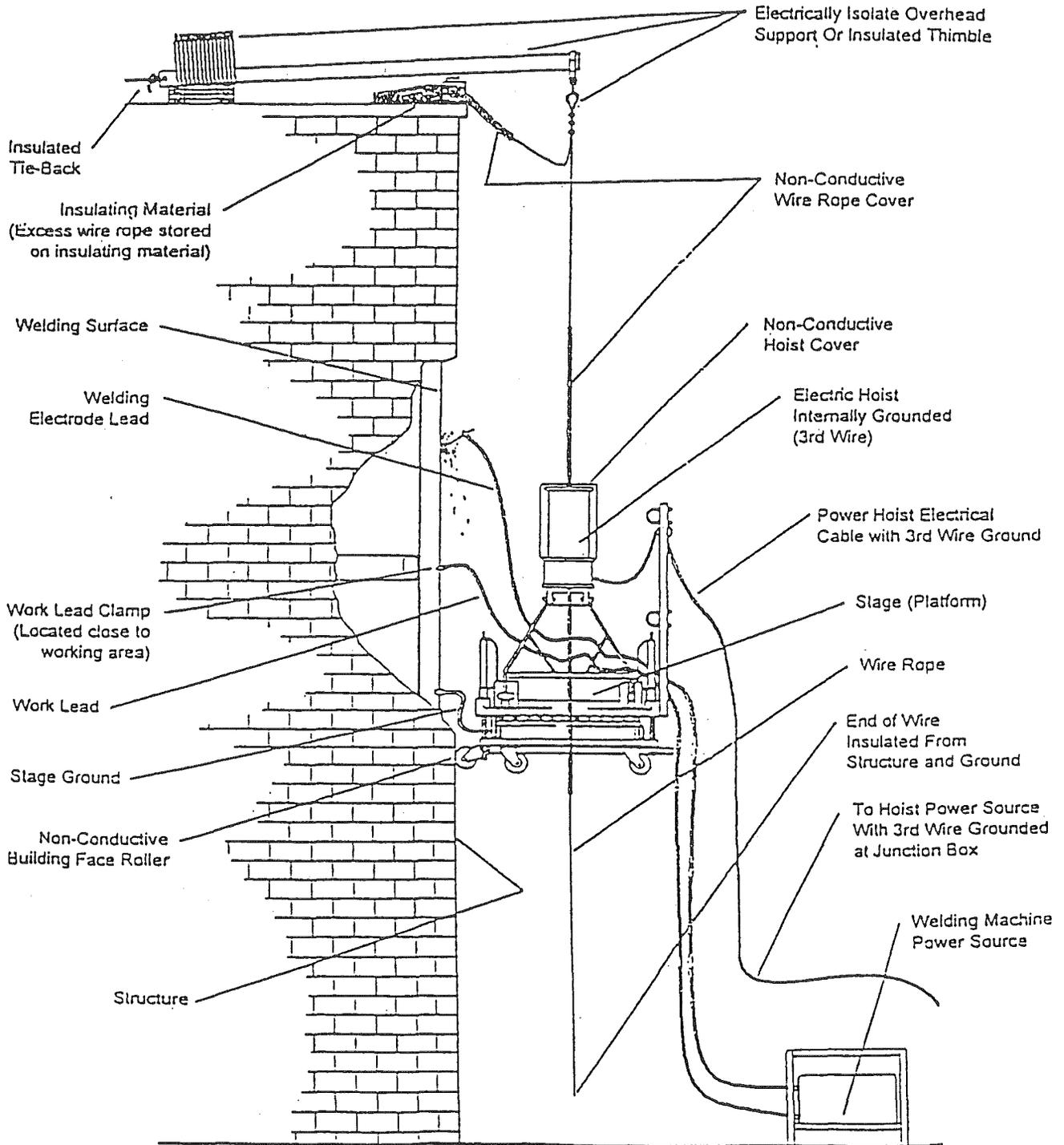
WAC 296-155-498 Non-Mandatory Appendix E to Part J-1, Drawings and Illustrations. This Appendix provides drawings of particular types of scaffolds and scaffold components, and graphic illustrations of bracing patterns and tie spacing patterns.

This Appendix is intended to provide visual guidance to assist the user in complying with the requirements of Part J-1, chapter 296-155 WAC.

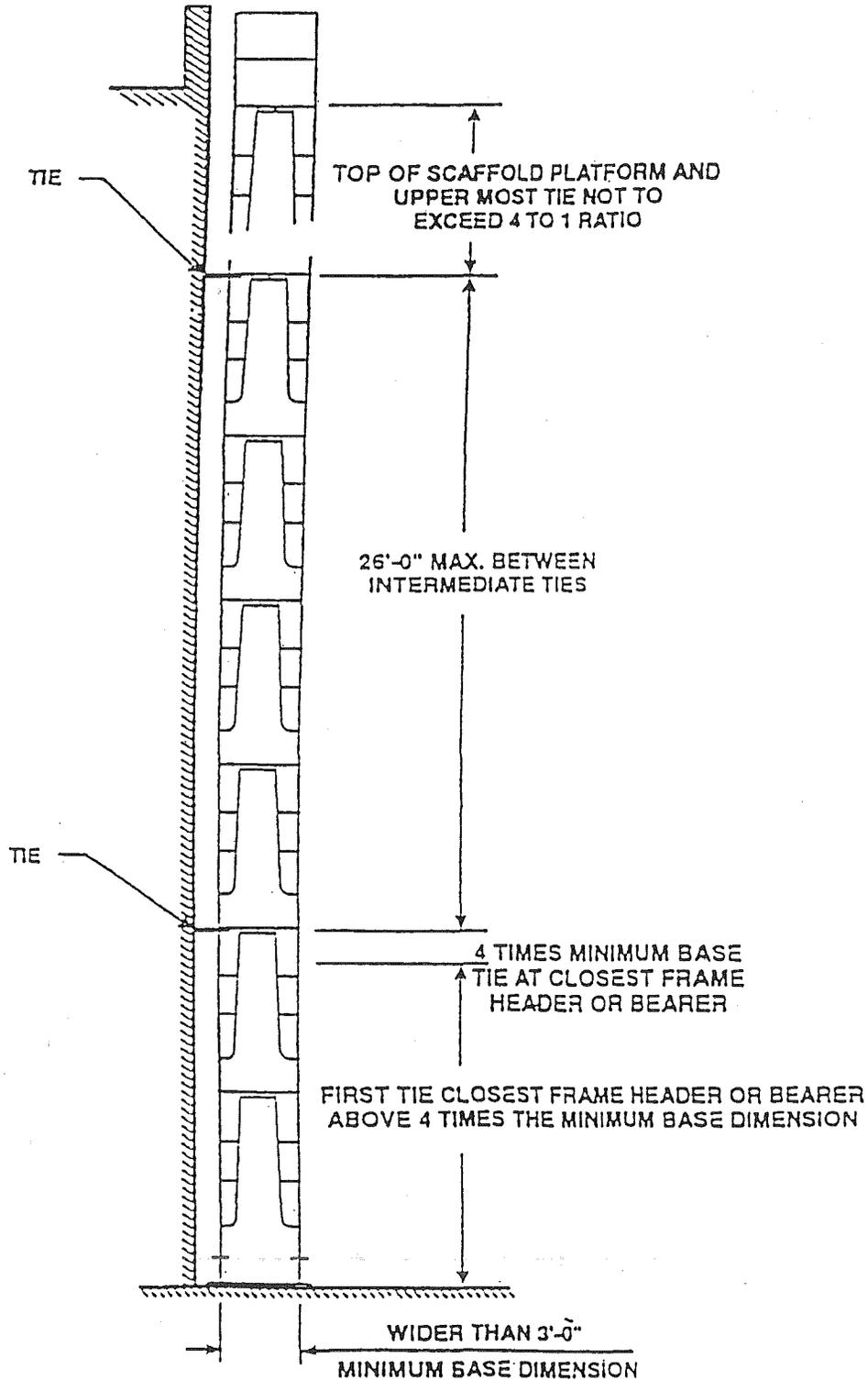
BRACING – TUBE & COUPLER SCAFFOLDS



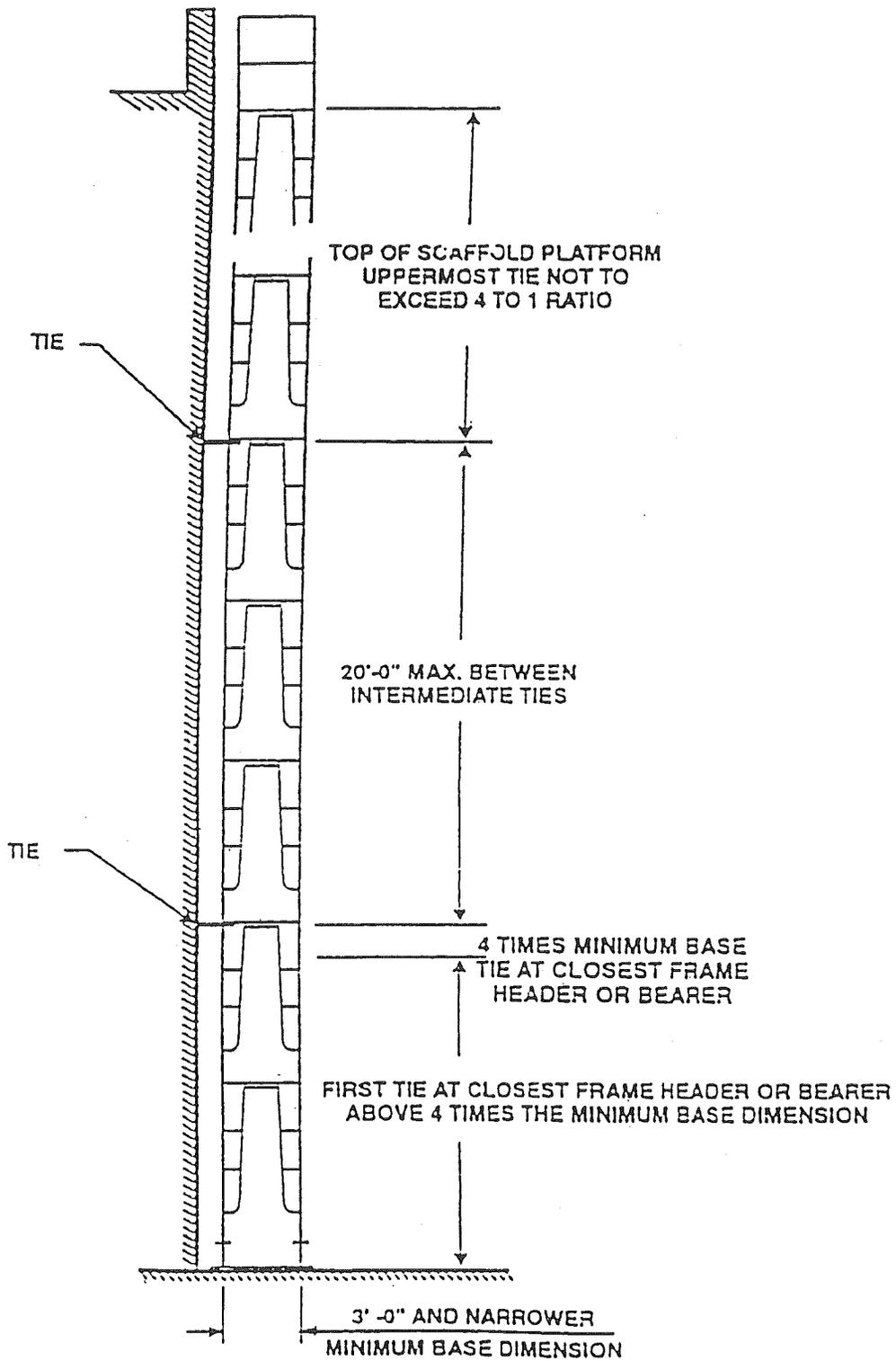
SUSPENDED SCAFFOLD PLATFORM WELDING PRECAUTIONS



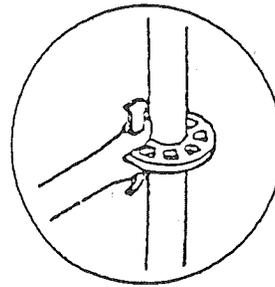
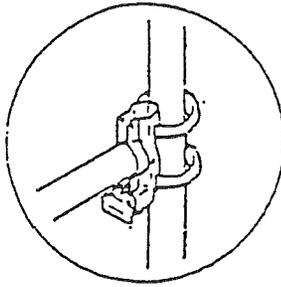
MAXIMUM VERTICAL TIE SPACING WIDER THAN 3'-0" BASES



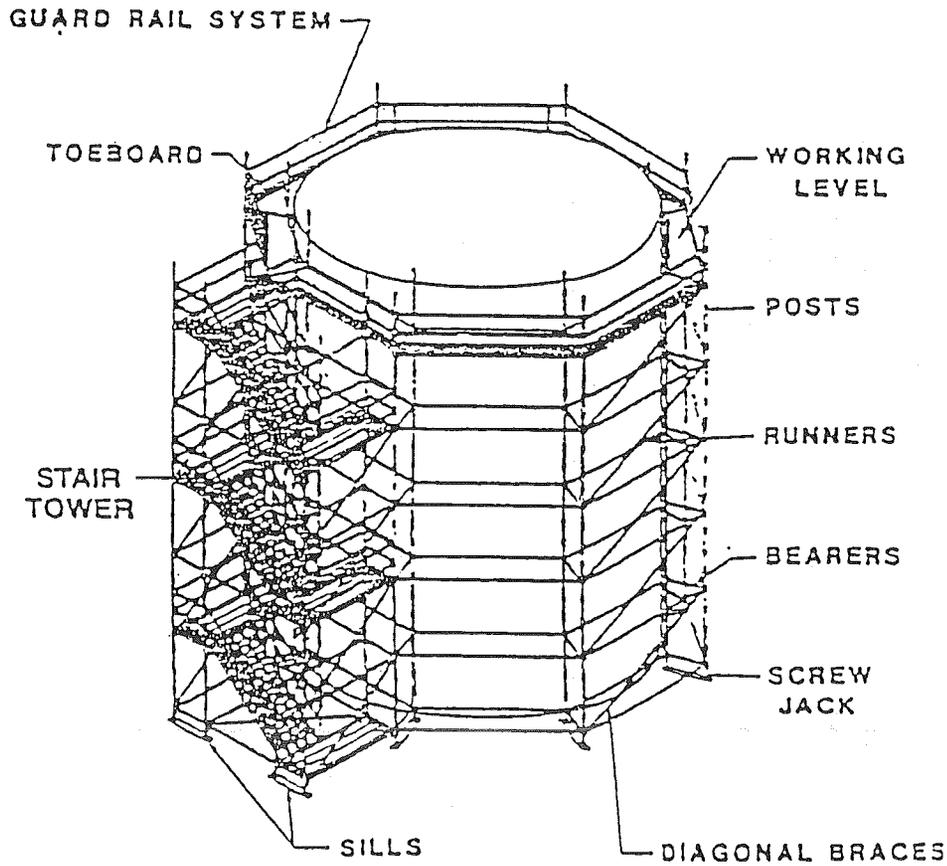
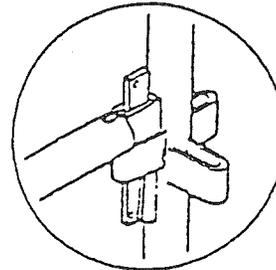
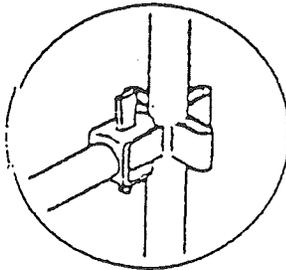
MAXIMUM VERTICAL TIE SPACING 3'- 0" AND NARROWER BASES



SYSTEM SCAFFOLD



JOINT CONNECTIONS
VARY ACCORDING
TO MANUFACTURER



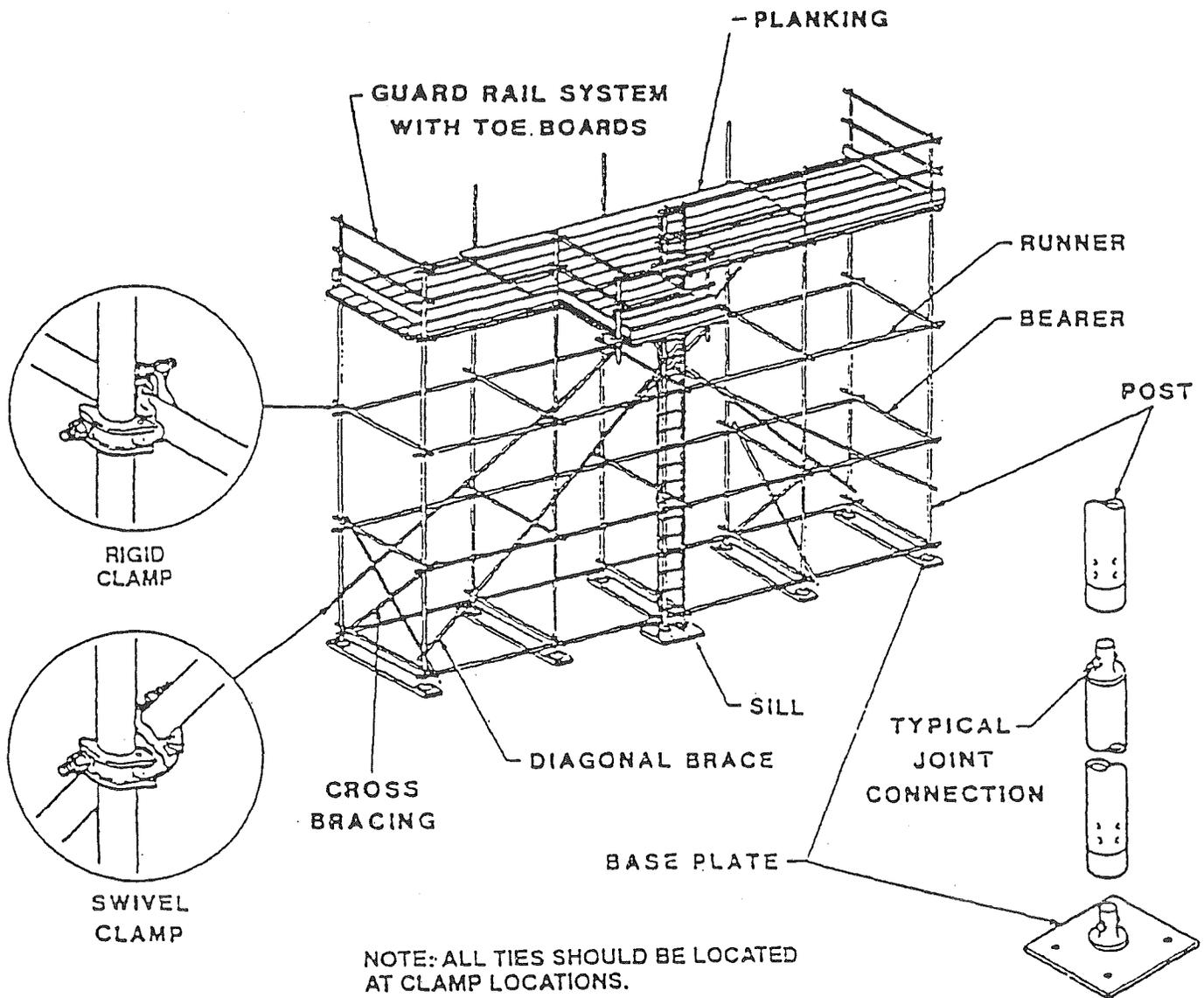
SPIB® DNS IND 65
KD19 S-DRY (7)
SCAFFOLD PLANK

Grade stamp courtesy of Southern Pine Inspection Bureau

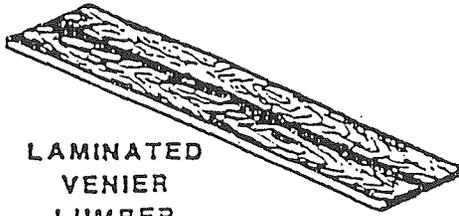
MILL 10
WC LB SEL STR
SCAF PLK
D. FIR S. DRY

Grade stamp courtesy of West Coast Lumber Inspection Bureau

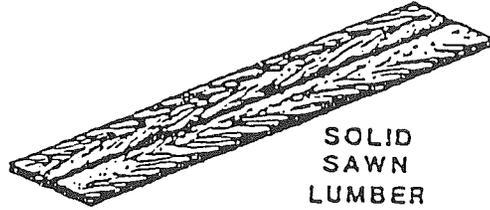
TUBE and COUPLER SCAFFOLD



SCAFFOLDING WORK SURFACES

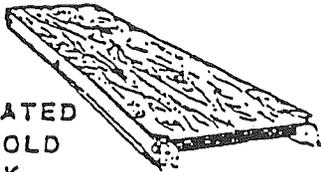


LAMINATED
VENIER
LUMBER
(LVL)

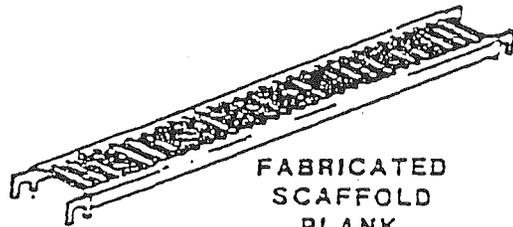


SOLID
SAWN
LUMBER

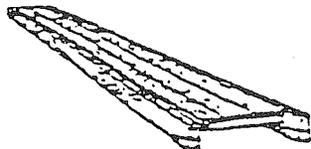
SCAFFOLD PLANKS



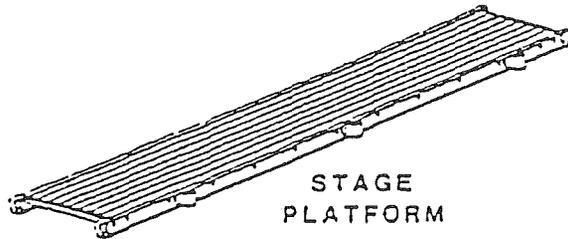
FABRICATED
SCAFFOLD
DECK



FABRICATED
SCAFFOLD
PLANK



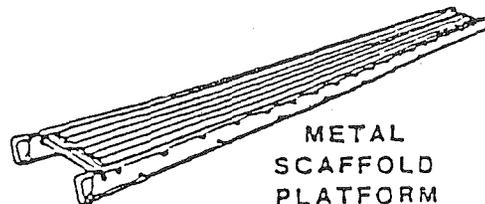
DECORATOR PLANK



STAGE
PLATFORM

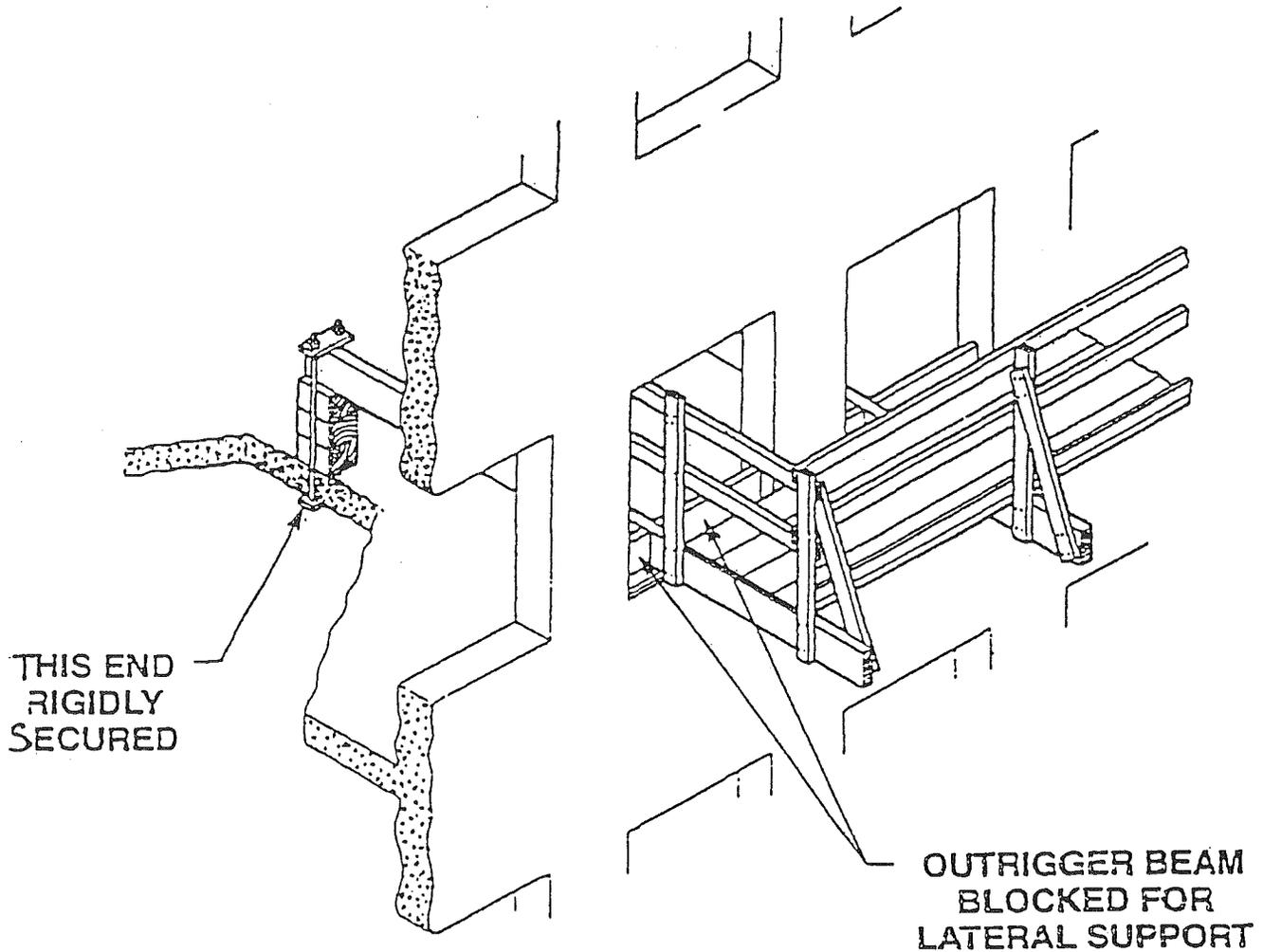


WOOD
SCAFFOLD
PLATFORM



METAL
SCAFFOLD
PLATFORM

OUTRIGGER SCAFFOLD



[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-498, filed 2/13/98, effective 4/15/98.]

PART K FLOOR OPENINGS, WALL OPENINGS AND STAIRWAYS

WAC 296-155-500 Definitions applicable to this part.

Floor hole means an opening measuring less than 12 inches but more than 1 inch in its least dimension in any floor, roof,

[Title 296 WAC—p. 2270]

or platform through which materials but not persons may fall, such as a belt hole, pipe opening, or slot opening.

Floor opening means an opening measuring 12 inches or more in its least dimension in any floor, roof, or platform, through which persons may fall.

Handrail means a rail used to provide employees with a handhold for support.

Low pitched roof means a roof having a slope less than or equal to four in twelve.

(1999 Ed.)

Mechanical equipment means all motor or human propelled wheeled equipment except for wheelbarrows, mop-carts, robotic thermoplastic welders and robotic crimpers.

Nose, nosing means that portion of a tread projecting beyond the face of the riser immediately below.

Platform means a walking/working surface for persons, elevated above the surrounding floor or ground, such as a balcony or platform for the operation of machinery and equipment.

Riser height means the vertical distance from the top of a tread to the top of the next higher tread or platform/landing or the distance from the top of a platform/landing to the top of the next higher tread or platform/landing.

Roof means the exterior surface on the top of a building. This does not include floors which, because a building has not been completely built, temporarily become the top surface of a building.

Roofing work means the hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.

Runway means a passageway for persons, elevated above the surrounding floor or ground level, such as a foot-walk along shafting or a walkway between buildings.

Safety monitoring system means a safety system in which a competent person monitors the safety of all employees in a roofing crew, and warns them when it appears to the monitor that they are unaware of the hazard or are acting in an unsafe manner. The competent person must be on the same roof and within visual distance of the employees, and must be close enough to verbally communicate with the employees.

Stair platform means an extended step or landing breaking a continuous run of stairs.

Stairrail system means a vertical barrier erected along the unprotected sides and edges of a stairway to prevent employees from falling to lower levels. The top surface of a stairrail system may also be a "handrail."

Stairs, stairways means a series of steps leading from one level or floor to another, or leading to platforms, pits, boiler rooms, crossovers, or around machinery, tanks, and other equipment that are used more or less continuously or routinely by employees or only occasionally by specific individuals. For the purpose of this part, a series of steps and landings having three or more rises constitutes stairs or stairway.

Standard railing means a vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent falls of persons.

Standard strength and construction means any construction of railings, covers, or other guards that meets the requirements of this part.

Toeboard means a vertical barrier at floor level erected along exposed edges of a floor opening, wall opening, platform, runway, or ramp to prevent falls of materials.

Tread depth means the horizontal distance from front to back of tread (excluding nosing, if any).

Unprotected side or edge means any side or edge of a roof perimeter where there is no wall three feet (.9 meters) or more in height.

Wall opening means an opening at least 30 inches high and

18 inches wide, in any wall or partition, through which persons may fall, such as an opening for a window, a yard arm doorway or chute opening.

Work area means that portion of a roof where roofing work is being performed.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-500, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-500, filed 4/25/95, effective 10/1/95; 91-24-017 (Order 91-07), § 296-155-500, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-500, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-500, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-500, filed 6/17/81; Order 74-26, § 296-155-500, filed 5/7/74, effective 6/6/74.]

WAC 296-155-505 Guardrails, handrails and covers.

(1) General provisions. This part applies to temporary or emergency conditions where there is danger of employees or materials falling through floor, roof, or wall openings, or from stairways, runways, ramps, open sided floors, open sides of structures, bridges, or other open sided walking or working surfaces. When guardrails or covers required by this section must be temporarily removed to perform a specific task, the area shall be constantly attended by a monitor to warn others of the hazard or shall be protected by a movable barrier.

(2) Guarding of floor openings and floor holes.

(a) Floor openings shall be guarded by a standard railing and toe boards or cover, as specified in subsections (2)(g) and (5) of this section. In general, the railing shall be provided on all exposed sides, except at entrances to stairways. All vehicle service pits shall have a cover or removable type standard guardrail. When not in use, pits shall be covered or guarded. Where vehicle service pits are to be used again immediately, and the service person is within a 50 foot distance of the unguarded pit and also within line of sight of the unguarded pit, the cover or guardrail need not be replaced between uses. Where vehicle service pits are used frequently, the perimeters of the pits shall be delineated by high visibility, luminescent, skid resistant paint. Such painted delineation shall be kept clean and free of extraneous materials.

(b) Ladderway floor openings or platforms shall be guarded by standard railings with standard toe boards on all exposed sides, except at entrance to opening, with the passage through the railing either provided with a swinging gate or so offset that a person cannot walk directly into the opening.

(c) Hatchways and chute floor openings shall be guarded by one of the following:

(i) Hinged covers of standard strength and construction and a standard railing with only one exposed side. When the opening is not in use, the cover shall be closed or the exposed side shall be guarded at both top and intermediate positions by removable standard railings;

(ii) A removable standard railing with toe board on not more than two sides of the opening and fixed standard railings with toe boards on all other exposed sides. The removable railing shall be kept in place when the opening is not in

use and shall be hinged or otherwise mounted so as to be conveniently replaceable.

(d) Wherever there is danger of falling through a skylight opening, and the skylight itself is not capable of sustaining the weight of a two hundred pound person with a safety factor of four, standard guardrails shall be provided on all exposed sides or the skylight shall be covered in accordance with (g) of this subsection.

(e) Pits and trap door floor openings shall be guarded by floor opening covers of standard strength and construction. While the cover is not in place, the pit or trap openings shall be protected on all exposed sides by removable standard railings.

(f) Manhole floor openings shall be guarded by standard covers which need not be hinged in place. While the cover is not in place, the manhole opening shall be protected by standard railings.

(g) All floor opening or hole covers shall be capable of supporting the maximum potential load but never less than two hundred pounds (with a safety factor of four).

(i) All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees.

(ii) All covers shall be color coded or they shall be marked with the word "hole" or "cover" to provide warning of the hazard.

(iii) If it becomes necessary to remove the cover, a monitor shall remain at the opening until the cover is replaced. The monitor shall advise persons entering the area of the hazard, shall prevent exposure to the fall hazard and shall perform no other duties.

(h) Floor holes, into which persons can accidentally walk, shall be guarded by either a standard railing with standard toe board on all exposed sides, or a floor hole cover of standard strength and construction that is secured against accidental displacement. While the cover is not in place, the floor hole shall be protected by a standard railing.

(3) Guarding of wall openings.

(a) Wall openings, from which there is a drop of more than 4 feet, and the bottom of the opening is less than 3 feet above the working surface, shall be guarded as follows:

(i) When the height and placement of the opening in relation to the working surface is such that either a standard rail or intermediate rail will effectively reduce the danger of falling, one or both shall be provided;

(ii) The bottom of a wall opening, which is less than 4 inches above the working surface, regardless of width, shall be protected by a standard toe board or an enclosing screen either of solid construction or as specified in subsection (5)(e)(ii) of this section.

(b) An extension platform, outside a wall opening, onto which materials can be hoisted for handling shall have standard guardrails on all exposed sides or equivalent. One side of an extension platform may have removable railings in order to facilitate handling materials.

(c) When a chute is attached to an opening, the provisions of (a) of this subsection shall apply, except that a toe board is not required.

(4) Guarding of open sided surfaces.

(a) Every open sided floor, platform or surface four feet or more above adjacent floor or ground level shall be guarded by a standard railing, or the equivalent, as specified in subsection (5)(a) of this section, on all open sides, except where there is entrance to a ramp, stairway, or fixed ladder. The railing shall be provided with a standard toe board wherever, beneath the open sides, persons can pass, or there is moving machinery, or there is equipment with which falling materials could create a hazard.

(b) Runways shall be guarded by a standard railing, or the equivalent, as specified in subsection (5) of this section, on all open sides, 4 feet or more above the floor or ground level. Wherever tools, machine parts, or materials are likely to be used on the runway, a toe board shall also be provided on each exposed side.

(c) Runways used exclusively for special purposes may have the railing on one side omitted where operating conditions necessitate such omission, providing the falling hazard is minimized by using a runway not less than 18 inches wide.

(d) Where employees entering upon runways become thereby exposed to machinery, electrical equipment, or other danger not a falling hazard, additional guarding shall be provided.

(e) Regardless of height, open sided floors, walkways, platforms, or runways above or adjacent to dangerous equipment, pickling or galvanizing tanks, degreasing units, and similar hazards, shall be guarded with a standard railing and toe board.

(f) Open sides of gardens, patios, recreation areas and similar areas located on roofs of buildings or structures shall be guarded by permanent standard railings or the equivalent. Where a planting area has been constructed adjacent to the open sides of the roof and the planting area is raised above the normal walking surface of the roof area, the open side of the planting area shall also be protected with standard railings or the equivalent.

(5) Standard specifications.

(a) A standard railing shall consist of top rail, intermediate rail, toe board, and posts, and shall have a vertical height of 36 inches to 42 inches from upper surface of top rail to floor, platform, runway, or ramp level. Each length of lumber shall be smooth surfaced throughout the length of the railing. The intermediate rail shall be halfway between the top rail and the floor, platform, runway, or ramp. The ends of the rails shall not overhang the terminal posts except where such overhang does not constitute a projection hazard. Minimum requirements for standard railings under various types of construction are specified in the following items:

(i) For wood railings, the posts shall be of at least 2 inch by 4 inch stock spaced not to exceed 8 feet; the top rail shall be of at least 2 inch by 4 inch stock; the intermediate rail shall be of at least 1 inch by 6 inch stock.

(ii) For pipe railings, posts and top and intermediate railings shall be at least 1 1/2 inches nominal OD diameter with posts spaced not more than 8 feet on centers.

(iii) For structural steel railings, posts and top and intermediate rails shall be of 2 inch by 2 inch by 3/8 inch angles or other metal shapes of equivalent bending strength, with posts spaced not more than 8 feet on centers.

(iv) For wire rope railings, the top and intermediate railings shall be at least 1/2 inch fibre core rope, or the equivalent to meet strength factor and deflection of (a)(v) of this subsection. Posts shall be spaced not more than 8 feet on centers. The rope shall be stretched taut, so as to present a minimum deflection.

(v) The anchoring of posts and framing of members for railings of all types shall be of such construction that the completed structure shall be capable of withstanding a load of at least 200 pounds applied in any direction at any point on the top rail, with a minimum of deflection.

(vi) Railings receiving heavy stresses from employees trucking or handling materials shall be provided additional strength by the use of heavier stock, closer spacing of posts, bracing, or by other means.

(vii) Other types, sizes, and arrangements of railing construction are acceptable, provided they meet the following conditions:

(A) A smooth surfaced top rail at a height above floor, platform, runway, or ramp level of between 36 inches and 42 inches;

(B) A strength to withstand at least the minimum requirement of 200 pounds top rail pressure with a minimum of deflection;

(C) Protection between top rail and floor, platform, runway, ramp, or stair treads, equivalent at least to that afforded by a standard intermediate rail;

(D) Elimination of overhang of rail ends unless such overhang does not constitute a hazard.

(b)(i) A standard toe board shall be 4 inches minimum in vertical height from its top edge to the level of the floor, platform, runway, or ramp. It shall be securely fastened in place and have not more than 1/4 inch clearance above floor level. It may be made of any substantial material, either solid, or with openings not over 1 inch in greatest dimension.

(ii) Where material is piled to such height that a standard toe board does not provide protection, paneling, or screening from floor to intermediate rail or to top rail shall be provided.

(c) Floor opening covers shall be of any material that meets the following strength requirements:

(i) Conduits, trenches, and manhole covers and their supports, when located in roadways, and vehicular aisles shall be designed to carry a truck rear axle load of at least 2 times the maximum intended load;

(ii) All floor opening covers shall be capable of supporting the maximum potential load but never less than two hundred pounds (with a safety factor of four).

(A) All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees.

(B) All covers shall be color coded or they shall be marked with the word "hole" or "cover" to provide warning of the hazard.

(C) If it becomes necessary to remove the cover, a monitor shall remain at the opening until the cover is replaced. The monitor shall advise persons entering the area of the hazard, shall prevent exposure to the fall hazard and shall perform no other duties.

(1999 Ed.)

(d) Skylight openings that create a falling hazard shall be guarded with a standard railing, or covered in accordance with (c)(ii) of this subsection.

(e) Wall opening protection shall meet the following requirements:

(i) Barriers shall be of such construction and mounting that, when in place at the opening, the barrier is capable of withstanding a load of at least 200 pounds applied in any direction (except upward), with a minimum of deflection at any point on the top rail or corresponding member.

(ii) Screens shall be of such construction and mounting that they are capable of withstanding a load of at least 200 pounds applied horizontally at any point on the near side of the screen. They may be of solid construction of grill work with openings not more than 8 inches long, or of slat work with openings not more than 4 inches wide with length unrestricted.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-505, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-505, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-505, filed 7/20/94, effective 9/20/94; 91-24-017 (Order 91-07), § 296-155-505, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-505, filed 1/10/91, effective 2/12/91; 90-03-029 (Order 89-20), § 296-155-505, filed 1/11/90, effective 2/26/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-505, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-505, filed 6/17/81; Order 76-29, § 296-155-505, filed 9/30/76; Order 74-26, § 296-155-505, filed 5/7/74, effective 6/6/74.]

WAC 296-155-50503 Roofing brackets. (1) Roofing brackets shall be constructed to fit the pitch of the roof.

(2) Securing: Brackets shall be secured in place by nailing in addition to the pointed metal projections. When it is impractical to nail brackets, rope supports shall be used. When rope supports are used, they shall consist of first grade manila of at least 3/4 inch diameter, or equivalent.

(3) Crawling boards or chicken ladders.

(a) Crawling boards shall be not less than ten inches wide and one inch thick, having cleats 1 x 1/2 inches.

(i) The cleats shall be equal in length to the width of the board and spaced at equal intervals not to exceed twenty-four inches.

(ii) Nails shall be driven through and clinched on the underside.

(iii) The crawling board shall extend from the ridge pole to the eaves when used in connection with roof construction, repair, or maintenance.

(b) A firmly fastened lifeline of at least 3/4 inch diameter rope, or equivalent, shall be strung beside each crawling board for a handhold.

(c) Crawling boards shall be secured to the roof by means of adequate ridge hooks or other effective means.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-50503, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-50503, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-50503, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-50503, filed 1/21/86.]

WAC 296-155-50505 Reserved.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-50505, filed 7/20/94, effective 9/20/94; 91-24-017 (Order 91-07), § 296-155-50505, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW

49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-50505, filed 1/21/86.]

WAC 296-155-510 Reserved.

[Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-510, filed 11/22/91, effective 12/24/91; 89-11-035 (Order 89-03), § 296-155-510, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-510, filed 1/21/86; Order 74-26, § 296-155-510, filed 5/7/74, effective 6/6/74.]

WAC 296-155-515 Ramps, runways, and inclined walkways. (1) Width. Ramps, runways and inclined walkways shall be eighteen inches or more wide.

(2) Standard railings. Ramps, runways and inclined walkways shall be provided with standard railings when located four feet or more above ground or floor level.

(3) Ramp specifications. Ramps, runways and walkways shall not be inclined more than twenty degrees from horizontal and when inclined shall be cleated or otherwise treated to prevent a slipping hazard on the walking surface.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-515, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-515, filed 4/25/95, effective 10/1/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-515, filed 1/21/86.]

PART L

CRANES, DERRICKS, HOISTS, ELEVATORS, AND CONVEYORS

WAC 296-155-525 Cranes and derricks. (1) Definitions applicable to this part:

Accessory - a secondary part or assembly of parts which contributes to the overall function and usefulness of a machine.

Administrative or regulatory authority - a governmental agency, or the employer in the absence of governmental jurisdiction.

Angle indicator (boom) - an accessory which measures the angle of the boom to the horizontal.

Appointed - assigned specific responsibilities by the employer or the employer's representative.

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

Auxiliary hoist - a secondary hoist rope system used either in conjunction with, or independently of, the main hoist system.

Axis of rotation - the vertical axis around which the crane superstructure rotates.

Axle - the shaft or spindle with which or about which a wheel rotates. On wheel-mounted cranes it refers to a type of axle assembly including housings, gearing, differential, bearings, and mounting appurtenances.

Axle (bogie) - two or more axles mounted in tandem in a frame so as to divide the load between the axles and permit vertical oscillation of the wheels.

Ballast - weight used to supplement the weight of the machine in providing stability for lifting working loads (the term **ballast** is normally associated with locomotive cranes).

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Base, anchor bolt - a crane base that is bolted to a footing.

Base, expendable - for static-mounting cranes, a style of bottom mast section or member that is cast into a concrete footing block; all or part of this component is lost to future installations.

Base, fixed - a crane base that does not travel. It may be expendable, knee braced, or anchor bolted.

Base (mounting) - the traveling base on which the rotating superstructure of a locomotive or crawler crane is mounted.

Base, tower crane - the lowermost supporting component of the crane.

Base, travel - a crane base that is a ballasted platform mounted on trucks that ride along rails.

Boom (crane) - a member hinged at the rotating superstructure and used for supporting the existing tackle.

Boom angle - the angle above or below horizontal of the longitudinal axis of the base boom section.

Boom hoist mechanism - means for supporting the boom and controlling the boom angle.

Boom point - the outer extremity of the crane boom, containing the hoist sheave assembly.

Boom point sheave assembly - an assembly of sheaves and pin built as an integral part of the boom point.

Boom stop - a device used to limit the angle of the boom at the highest recommended position.

Brake - a device used for retarding or stopping motion.

Brace, tower - a structural attachment placed between a crane tower and an adjacent structure to pass loads to the adjacent structure and permit the crane to be erected to greater than free standing height.

Buffer - an energy absorbing device for reducing impact when a moving crane or trolley reaches the end of its permitted travel.

Cab - a housing which covers the rotating superstructure machinery, or the operator's or driver's station.

Climbing frame - a frame used with climbing cranes to transmit operational and climbing reactions to the host building frame.

Climbing ladder - a steel member with crossbars (used in parts) suspended from a climbing frame and used as jacking support points when some cranes climb.

Clutch - a means for engagement or disengagement of power.

Commercial truck vehicle - a commercial motor vehicle designed primarily for the transportation of property in connection with business and industry.

Counterweight - weight used to supplement the weight of the machine in providing stability for lifting working loads.

Counterweight jib - a horizontal member of a crane on which the counterweights and usually the hoisting machinery are mounted.

Crane carrier - the undercarriage of a wheel-mounted crane specifically designed for transporting the rotating crane superstructure. It may or may not provide its own travel mechanism. It is distinguished from a commercial truck vehi-

cle in that it is not designed to transport personnel, materials, or equipment other than the crane-rotating superstructure.

Cross-over points - in multiple layer spooling of rope on a drum, those points of rope contact where the rope crosses the preceding rope layer.

Designated - selected or assigned by the employer or the employer's representative as being competent to perform specific duties.

Drum - the cylindrical member around which a rope is wound for lifting and lowering the load or boom.

Dynamic (loading) - loads introduced into the machine or its components due to accelerating or decelerating forces.

Flange point - a point of contact between rope and drum flange where the rope changes layers.

Free standing height - that height of a crane which is supported by the tower (mast) alone without assistance from braces, guys, or other means.

Gage, track - the horizontal distance between two rails measured perpendicular to the direction of travel.

Gantry (A-frame) - a structural frame, extending above the superstructure, to which the boom support ropes are reeved.

High strength (traction) bolts - high strength tensile bolts used in the assembly of crane sections. The bolts are installed in tension by torquing or other means at a level greater than that produced by in- or out-of-service loads for the purpose of reducing the likelihood of bolt fatigue failure.

Hoist mechanism - a hoist drum and rope reeving system used for lifting and lowering loads.

Jib - an extension attached to the boom point to provide added boom length for lifting specified loads. The jib may be in line with the boom or offset to various angles in the vertical plane of the boom.

Jib backstop - a device which will restrain the jib from turning over backward.

Job site - work area defined by the construction contract.

Limiting device - a mechanical device which is operated by some part of a power driven machine or equipment to control loads or motions of the machine or equipment.

Load (working) - the external load in pounds (kilograms) applied to the crane, including the weight of load-attaching equipment such as lower load block, shackles, and slings.

Load block, lower - the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended by the hoisting ropes.

Load block, upper - the assembly of shackle, swivel, sheaves, pins, and frame suspended from the boom point.

Load ratings - crane ratings in pounds (kilograms) established by the manufacturer.

Mast (boom) - a frame hinged at or near the boom hinge for use in connection with supporting a boom. The head of the mast is usually supported and raised or lowered by the boom hoist ropes.

Mast (jib) - a frame hinged at or near the boom point for use in connection with supporting a jib.

Normal operating conditions.

Cab- or station-operated cranes - conditions during which a crane is performing functions within the manufac-

turer's operating recommendations. Under these conditions, the operator is at the operating control devices on the crane, and no other persons except those appointed are to be on the crane.

Ground- or floor-operated cranes - conditions during which a crane is performing functions within the manufacturer's operating recommendations. Under these conditions, the operator is at the operating control devices that are mounted to the crane but operated with the operator off the crane, and no other persons except those appointed are to be on the crane.

Remote-operated cranes - conditions during which a crane is performing functions within the manufacturer's operating recommendations. Under these conditions, the operator is at the operating control devices that are mounted to any part of the crane, and no other persons except those appointed are to be on the crane.

Out-of-service - the condition of a crane when unloaded, without power and with the controls unattended and prepared to endure winds above the in-service level.

Outriggers - extendable or fixed members attached to the mounting base, which rest on supports at the outer ends used to support the crane.

Pawl (dog) - a device for positively holding a member against motion in one or more directions.

Payload - that load or loads being transported by the commercial truck chassis from place to place.

Pendant - a rope or strand of specified length with fixed end connections.

Pitch diameter - the diameter of a sheave or rope drum measured at the center line of the rope.

Power-controlled lowering - a system or device in the power train, other than the load hoist brake, which can control the lowering rate of speed of the load hoist mechanism.

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

Radius (load) - the horizontal distance from a projection of the axis of rotation to the base of the crane, before loading, to the center of the vertical hoist line or tackle with load applied.

Rail clamp - a tong-like metal device mounted on a locomotive crane car, which can be connected to the track.

Reeving - a rope system in which the rope travels around drums and sheaves.

Remote control station - a location, not on the crane, from which the operator can control all the crane movements.

Repetitive pickup point - when operating on a short cycle operation, the rope being used on a single layer and being spooled repetitively over a short portion of the drum.

Rope - refers to wire rope unless otherwise specified.

Rotation resistant rope - a wire rope consisting of an inner layer of strand laid in one direction covered by a layer of strand laid in the opposite direction. This has the effect of counteracting torque by reducing the tendency of the finished rope to rotate.

Running rope - a rope which travels around sheaves or drums.

Shall - this word indicates that the rule is mandatory and must be followed.

Service, light - service that involves irregular operation with loads generally about one-half or less of the rated load; a service crane at a storage yard or building site would be an example.

Service, normal - service that involves operating occasionally at rated load but normally at less than eighty-five percent of the rated load and not more than ten lift cycles per hour except for isolated instances; a crane used for concrete placement at a building site would be an example.

Service, heavy - service that involves operating at eighty-five percent to one hundred percent of the rated load or in excess of ten lift cycles per hour as a regular specified procedure; some cranes operating at material yards or in industrial applications may fall into this category.

Sheave - a grooved wheel or pulley used with a rope to change the direction and point of application of a pulling force.

Should - this word indicates that the rule is a recommendation, the advisability of which depends on the facts in each situation.

Side loading - a load applied to an angle to the vertical plane of the boom.

Stabilizer - stabilizers are extendable or fixed members attached to the mounting base to increase the stability of the crane, but which may not have the capability of relieving all of the weight from wheels or tracks.

Standby crane - a crane which is not in regular service but which is used occasionally or intermittently as required.

Standing (guy) rope - a supporting rope which maintains a constant distance between the points of attachment to the two components connected by the rope.

Structural competence - the ability of the machine and its components to withstand the stresses imposed by applied loads.

Superstructure - the rotating upper frame structure of the machine and the operating machinery mounted thereon.

Swing - rotation of the superstructure for movement of loads in a horizontal direction about the axis of rotation.

Swing mechanism - the machinery involved in providing rotation of the superstructure.

Swivel - a load carrying member with thrust bearings to permit rotation under load in a plane perpendicular to the direction of the load.

Swiveling - the rotation of the load attachment portion (hook or shackle) of a load block (lower) or hook assembly about its axis of suspension in relation to the load line(s).

Tackle - an assembly of ropes and sheaves arranged for lifting, lowering, or pulling.

Telescoping boom - consists of a base boom from which one or more boom sections are telescoped for additional length.

Telescoping (tower crane) - a process whereby the height of a traveling or fixed base crane is increased typically by raising the inner tower and then adding sections at the top of the outer tower; there are also cranes that are telescoped by adding to the inner tower from below.

Tower (mast) - a vertical structural frame consisting of columns and bracing capable of supporting an upperstructure

with its working and dynamic loads and transmitting them to the supporting surface or structure.

Traction (high strength) bolts - see high strength bolts.

Transit - the moving or transporting of a crane from one job site to another.

Travel - the function of the machine moving under its own power from one location to another on a job site.

Trolley - the device that travels along the load jib and contains the upper load block.

Two-blocking - the condition in which the lower load block or hook assembly comes in contact with the upper load block or boom point sheave assembly.

Weathervaning - wind induced rotation of a crane upperstructure, when out-of-service, to expose minimal surface area to the wind.

Wedge - a tapered wood or steel device used to provide stability to cranes during use as a climber. When the wedges are tightened against the four main legs of the tower, they convert overturning moments into horizontal forces to be resisted by the floor framing or slab.

Wheel base - the distance between centers of front and rear axles. For a multiple axle assembly the axle center for wheel base measurement is taken as the midpoint of the assembly.

Whipline (runner or auxiliary) - a secondary rope system usually of lighter load capacity than that provided by the main rope system.

Winch head - a power driven spool for handling of loads by means of friction between fiber or wire rope and the spool.

(2) General requirements.

(a) The employer shall comply with the manufacturer's specifications and limitations applicable to the operation of any and all cranes and derricks. Where manufacturer's specifications are not available the limitations assigned to the equipment shall be based on the determinations of a qualified engineer, competent in this field and such determinations will be appropriately documented and recorded. Attachments used with cranes shall not exceed the capacity, rating, or scope recommended by the manufacturer.

(b) Rated load capacities, and recommended operating speeds, and special hazard warnings, or instruction, shall be conspicuously posted on all equipment. Instructions or warnings shall be visible to the operator while at the control station.

(c) Hand signals to crane and derrick operators shall be those prescribed by the applicable ANSI standard for the type of crane in use. An illustration of the signals shall be posted at the job site.

(d) The employer shall designate a competent person who shall inspect all machinery and equipment prior to each use, and periodically during use to make sure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use.

(e) A thorough, annual inspection of the hoisting machinery shall be made by a competent person, or by a government or private agency recognized by the department. The employer shall maintain a permanent record of the dates and results of all inspections for each hoisting machine and piece of equipment.

(f) A tag line or guide rope shall be used on all loads that swing freely. Guide ropes or tag lines shall be held by experienced persons.

(g) Care shall be taken to guard against injury to workers, or damage to scaffolds or buildings, from swinging loads.

(h) The operator shall avoid carrying loads over people.

(i) When work is stopped or when the derrick is not in operation, the boom shall be lowered to a horizontal position or tied in place to prevent it whipping with the wind or other external force.

(j) Only authorized personnel shall make sling hitches on loads.

(k) Workers shall not be allowed to ride on loads handled by derricks.

(l) Operators shall observe signals only from duly authorized persons. Under no circumstances shall a load be moved until the signal is received from authorized personnel.

(m) Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or other moving parts or equipment shall be guarded if such parts are exposed to contact by employees, or otherwise create a hazard. Guarding shall meet the requirements of chapter 296-24 WAC.

(n) A minimum distance of thirty inches clearance shall be maintained between the swing radius of the greatest extension of the crane superstructure or counterweights and a stationary object, including the crane itself, while the crane is in operation. When this clearance cannot be maintained, suitable barricades or safeguards shall be used to isolate the pinch point hazard area.

(o) All exhaust pipes shall be guarded or insulated where contact by employees, in the performance of normal duties, is possible.

(3) Additional requirements.

(a) Whenever internal combustion engine powered equipment exhausts in enclosed spaces, tests shall be made and recorded to see that employees are not exposed to unsafe concentrations of toxic gases or oxygen deficient atmospheres. (See chapter 296-62 WAC, the general occupational health standards and other applicable standards.)

(b) All cab glazing shall be safety glazing material. Windows shall be provided in the front and on both sides of the cab or operator's compartment with visibility forward and to either side. Visibility forward shall include a vertical range adequate to cover the boom point at all times. The front window may have a section which can be readily removed or held open, if desired. If the section is of the type held in the open position, it shall be secured to prevent inadvertent closure. A windshield wiper should be provided on the front window.

(c)(i) Where necessary for rigging or service requirements, a ladder or steps shall be provided to give access to a cab roof.

(ii) On cranes, guardrails, handholds and steps shall be provided for easy access to the car and cab in accordance with chapter 296-155 WAC, Part C-1 and Part J.

(iii) Platforms and walkways shall have anti-skid surfaces.

(d) Fuel tank filler pipe shall be located in such a position, or protected in such manner, as to not allow spill or

overflow to run onto the engine, exhaust, or electrical equipment of any machine being fueled.

(i) An accessible fire extinguisher of 5BC rating, or higher, shall be available at all operator stations or cabs of equipment.

(ii) All fuels shall be transported, stored, and handled to meet the rules of Part D of this chapter. When fuel is transported by vehicles on public highways, department of transportation rules concerning such vehicular transportation are considered applicable.

(e) Except where electrical distribution and transmission lines have been deenergized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines, equipment or machines shall be operated proximate to power lines only in accordance with the following:

(i) For lines rated 50 kV. or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet;

(ii) For lines rated over 50 kV., minimum clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1 kV. over 50 kV., or twice the length of the line insulator, but never less than 10 feet;

(iii) In transit with no load and boom lowered, the equipment clearance shall be a minimum of 4 feet for voltages less than 50 kV., and 10 feet for voltages over 50 kV. up to and including 345 kV., and 16 feet for voltages up to and including 750 kV.;

(iv) A person shall be designated to observe clearance of the equipment and give timely warning to insure that the required separation is maintained for all operations where it is difficult for the operator to maintain the desired clearance by visual means;

(v) Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other regulation of this part even if such device is required by law or regulation;

(vi) Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded;

(vii) Prior to work near transmitter tower where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be deenergized or tests shall be made to determine if electrical charge is induced on the crane.

(f) The following precautions shall be taken when necessary to dissipate induced voltage:

(i) The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom; and

(ii) Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews shall be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.

(iii) Combustible and flammable materials shall be removed from the immediate area prior to operations.

(g) No modifications or additions which affect the capacity or safe operation of the equipment shall be made by the employer without the manufacturer's or a qualified engineer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

(h) The employer shall comply with Power Crane and Shovel Association, Mobile Hydraulic Crane Standard No. 2.

(i) Sideboom cranes mounted on wheel or crawler tractors shall meet the requirements of SAE J743a-1964.

(4) Crawler, locomotive, and truck cranes.

(a) All jibs shall have positive stops to prevent their movement of more than 5° above the straight line of the jib and boom on conventional type crane booms. The use of cable type belly slings does not constitute compliance with this standard.

(b) All crawler, truck or locomotive cranes in use shall meet the applicable requirements for design, inspection, construction, testing, maintenance and operation as prescribed in the ANSI B30.5-1989, Safety Code for Crawler, Locomotive and Truck Cranes.

(5) Tower cranes.

(a) Tower cranes shall be erected, jumped and dismantled under the immediate supervision of a competent person, designated by the employer.

(b) Tower cranes shall be erected, maintained and used in accordance with the manufacturer's specifications, recommendations and procedures. All modifications shall be approved by the manufacturer and engineered by a professional engineer. The safety factors shall not be reduced by any modifications. The crane plates and charts shall be changed to reflect any modifications made.

(c) A professional engineer shall certify that the crane foundations and underlying soil are adequate support for the tower crane with its maximum overturning movement.

(d) Tower cranes shall be positioned whereby they can swing 360° without either the counterweight or jib striking any building, structure or other object, except:

(i) If the crane can strike an object or another crane, suitable limit switches shall be installed which will prohibit contact with such objects, or;

(ii) Direct voice communications shall be established between any operator of the tower crane(s) involved and a signalperson so stationed where the boom and/or counterweight movement, and the object with which it may contact can be observed so that the operator(s) can be warned of imminent danger.

(iii) A secondary means of positive communications shall be established as a back-up for possible direct voice communication failure.

(iv) Radio communication systems without tone coded squelch are prohibited. Citizens band radios shall not be used as a means of communications for tower cranes.

(e) Prior to installing a climbing tower crane within an existing building or new construction, a structural engineer shall certify that the building is designed to withstand the torque and floor loading created by the crane to be installed.

(f) Tower cranes erected on a new foundation shall be tested in accordance with ANSI B30.3-1990 Chapter 3-1.

(i) The test shall consist of suspending a load of not less than 110% of the rated capacity for 15 minutes. The load shall be suspended from the furthest point of the length of boom (jib) to be used. The results of this test shall be within the manufacturer's recommendations and/or specifications.

(ii) A record of each test shall be made and signed by the person responsible for conducting the test. Such records shall be maintained on the construction site for the duration of the construction work for which it was erected and subsequently made a part of the firm's permanent equipment records. Records shall be made available to authorized representatives of the department, upon request.

(g) A capacity chart shall be furnished by each crane manufacturer which shall include a full and complete range of crane load ratings at all stated operating radii for each allowable speed and each recommended counterweight load.

(i) Such chart shall be posted in the operator's cab or at the remote control stand in use. In lieu of the chart at the remote control stand, a minimum of two weight capacity signs shall be affixed to the jib or boom.

(ii) The chart shall be visible and readable to the operator while at the normal operating position.

(h) Operating controls shall be properly marked to indicate the function of the controls in each position.

(i) An operating and maintenance manual written in the English language shall be provided with each tower crane.

(j) Limit switches shall be installed and shall be kept properly adjusted. They shall be protected or isolated in a manner which will prevent unauthorized tampering. Limit switches shall provide the following functions:

(i) Safely limit the travel of the trolley to prevent it from hitting the outer end of the jib.

(ii) Limit the upward travel of the load block to prevent two-blocking.

(iii) Lower over travel limiting devices shall be provided for all load hoists where the hook area is not visible to the operator.

(iv) Limit the load being lifted in a manner whereby no more than 110% of the maximum rated load can be lifted or moved.

(k) The crane shall not be used to pull vehicles of any type, remove piling, loosen form work, pull away loads which are attached to the ground or walls, or for any operation other than the proper handling of freely suspended loads.

(l) When the operator may be exposed to the hazard of falling objects, the tower crane cab and/or remote control station shall have adequate overhead protection.

(m) The operator shall be protected from the weather. If enclosed cabs are provided they shall provide clear visibility in all directions and glass shall be approved safety glass or the equivalent.

(n) An approved and safe means shall be provided for access to operator's cab and machinery platform.

(o) When necessary for inspection or maintenance purposes, ladders, walkways with railing or other devices shall be provided.

(p) Each tower crane shall be provided with a slewing brake capable of preventing the jib or boom from rotating in

either direction and stopping the rotation of the jib or boom while loaded, when desired. Such brake shall have a holding device which, when set, will hold the jib or boom in a fixed location without additional attention of the operator. When the crane is out of operation, the jib or boom shall be pointed downwind and the slewing brake shall be released so as to permit the jib or boom to weathervane, providing the jib or boom has a clear 360 degree rotation. Where a 360 degree rotation is not provided, the jib or boom shall be pointed downwind from the prevailing wind and the slewing brake set.

(q) Each tower crane shall be provided with a braking system on the trolley capable of stopping and holding the trolley in any desired position while carrying a maximum load. This brake shall be capable of being locked in a fixed location without additional attention of the operator. An automatic brake or device shall be installed which will immediately stop and lock the trolley in position in the event of a breakage of the trolley rope.

(r) All electrical equipment shall be properly grounded and protection shall be provided against lightning.

(s) When the operator is actually operating the crane, the operator shall remain in a stationary position.

(t) All crane brakes shall automatically set in event of power failure. Swing brakes shall also function in this manner or be capable of being set manually.

(u) Climbing jack systems used for raising a tower crane shall be equipped with over-pressure relief valves, direct-reading pressure gauges, and pilot-operated hydraulic check valves installed in a manner which will prevent jack from retracting should a hydraulic line or fitting rupture or fail.

(v) During periods of high winds or weather affecting visibility, i.e., fog, etc., only loads shall be handled that are consistent with good safety practices. Good safety practices shall be mutually agreed upon by the operator and the person in charge of the construction job, with due consideration given to manufacturer's specifications and recommendations.

(w) Counterweights shall be securely fastened in place and shall not exceed the weight as recommended by the manufacturer for the length of jib being used. However, an amount of counterweight as recommended by the manufacturer shall be used.

(x) Tower cranes shall be inspected and maintained in accordance with the manufacturer's recommendations or more frequently if there is reason to suspect a possible defect or weakening of any portion of the structure or equipment.

(y) Guy wires, wedges, braces or other supports shall be inspected at the beginning and at midpoint of each working shift to ascertain that they are functioning as intended.

(6) Additional tower crane requirements.

(a) An approved method shall be instituted for transmitting signals to the operator. Standard hand signals for crane operations shall be used, whenever possible; however, if conditions are such that hand signals are ineffective, radio-controlled or electric-whistle signal or two-way voice communication shall be used. (See WAC 296-155-525 (4)(d).)

(b) Tower cranes shall not be erected or raised when the wind velocity at the worksite exceeds 20 m.p.h. or that specified by the manufacturer.

(c) Tower crane operators shall be trained and experienced in tower crane operations; however, for gaining experience, persons may operate the tower crane if under the immediate supervision of an experienced operator.

(d) Adequate clearance shall be maintained between moving and rotating structures of the crane and fixed objects to allow the passage of employees without harm.

(e) Employees required to perform duties on the horizontal boom of hammerhead tower cranes shall be protected against falling by guardrails or by a full body harness and lanyards attached to crane or to lifelines in conformance with Part C-1 of this chapter.

(f) Buffers shall be provided at both ends of travel of the trolley.

(g) Cranes mounted on rail tracks shall be equipped with limit switches limiting the travel of the crane on the track and stops or buffers at each end of the tracks.

(h) All hammerhead tower cranes in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, inspection, and operation as prescribed by the manufacturer.

(i) Access ladders inside the telescoping sections of tower cranes are exempt from those sections of the safety standards pertaining to cleat length and cleat spacing, but shall conform to manufacturer's recommendations and specifications.

(7) Overhead and gantry cranes.

(a) The rated load of the crane shall be plainly marked on each side of the crane, and if the crane has more than one hoisting unit, each hoist shall have its rated load marked on it or its load block, and this marking shall be clearly legible from the ground or floor.

(b) Bridge trucks shall be equipped with sweeps which extend below the top of the rail and project in front of the truck wheels.

(c) Except for floor-operated cranes, a gong or other effective audible warning signal shall be provided for each crane equipped with a power traveling mechanism.

(d) All overhead and gantry cranes in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, inspection, and operation as prescribed in ANSI B30.2.0-1990, Safety Code for Overhead and Gantry Cranes.

(8) Derricks. All derricks in use shall meet the applicable requirements for design, construction, installation, inspection, testing, maintenance, and operation as prescribed in American National Standard Institute B30.6-1990, Safety Code for Derricks.

(9) Floating cranes and derricks.

(a) Mobile cranes mounted on barges.

(i) When a mobile crane is mounted on a barge, the rated load of the crane shall not exceed the original capacity specified by the manufacturer.

(ii) A load rating chart, with clearly legible letters and figures, shall be provided with each crane, and securely fixed at a location easily visible to the operator.

(iii) When load ratings are reduced to stay within the limits for list of the barge with a crane mounted on it, a new load rating chart shall be provided.

(iv) Mobile cranes on barges shall be positively secured.

(b) Permanently mounted floating cranes and derricks.

(i) When cranes and derricks are permanently installed on a barge, the capacity and limitations of use shall be based on competent design criteria.

(ii) A load rating chart with clearly legible letters and figures shall be provided and securely fixed at a location easily visible to the operator.

(iii) Floating cranes and floating derricks in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, and operation as prescribed by the manufacturer.

(c) Protection of employees working on barges. The employer shall comply with the applicable requirements for protection of employees as specified in WAC 296-155-630.

(10) Mobile cranes and excavation machines.

(a) In all power driven shovel operations the person in charge shall issue instructions necessary to prevent accidents, to detect and correct unsafe acts and dangerous conditions, and to enforce all safety rules and regulations.

The person in charge shall also issue instructions on the proper method of using tools and handling material.

(b) Where the ground is soft or uneven, timbering and planking shall be used to provide firm foundation and distribute the load.

(c) In case of a breakdown, the shovel shall be moved away from the foot of the slope before repairs are made.

(d) All persons shall keep away from the range of the shovel's swing and shall not be permitted to stand back of the shovel or in line with the swing of the dipper during operation or moving of shovel.

(e) Unauthorized persons shall not be allowed on the shovel during operations, and the operator shall not converse with other persons while operating machine.

(f) The shovel dipper shall rest on the ground or on blocking during shut down periods.

(g) Shovels shall be inspected daily and all defects promptly repaired.

(h) All rubber tired mobile cranes shall be equipped with outriggers and sufficient blocking to properly stabilize crane while operating.

(i) Rubber tired mobile cranes shall be equipped with rear view mirrors.

(j) Positive boom stops shall be provided on all mobile cranes of the wheel and crawler type.

(k) Length of a crane boom and amount of counterweight shall not exceed manufacturer's rated capacity for equipment involved; except on isolated cases where permission is granted by the department.

(l) On all cranes where wedge beackets are used as terminal connections, the proper size wedge shall be used.

(m) On all mobile cranes, the hoist and boom drums shall be provided with a positive operated pawl or dog which shall be used in addition to the brake to hold the load and boom when they are suspended. Counterweight operated dogs are prohibited.

(n) Oiling and greasing shall be done under safe conditions with machine at rest, except when motion of machine is necessary.

(o) All steps, running boards, and boom ladder shall be of substantial construction and in good repair at all times.

(p) Operators shall not leave the cab while master clutch is engaged.

(q) Fire extinguishers shall be readily accessible and within reach of operator at all times.

(r) All shovel and crane cabs shall be kept clean and free of excess oil and grease on floor and machinery. Oily and greasy rags shall be disposed of immediately after use and not allowed to accumulate.

(s) Tools shall not be left on the cab floor. Spare cans of oil or fuel, and spare parts, shall not be stored in cabs, except in approved racks provided for that purpose.

(t) Mats or planking shall be used in moving shovels or cranes over soft or uneven ground.

(u) Cranes or shovels setting on steep grades shall be securely blocked or secured with a tail hold.

(v) Smoking shall be prohibited while fueling or oiling machines.

(w) Gasoline powered motors shall be stopped during refueling.

(x) Handling of movable feed line (bologna) shall be accomplished with insulated hooks and lineman's rubber gloves.

(y) Where cables cross roads they shall be elevated or placed in a trench.

(z) On all power shovels, including back-hoe types, of one-half cubic yard capacity or over, and on all dragline cranes or all-purpose cranes of the crawler or wheel type, two persons shall constitute the minimum working crew. It is mandatory that one be a qualified operator of the equipment in use. The job title of the other crew member may be oiler, rigger, signal person, or a laborer. The primary purpose of the second crew member is to signal the operator when the operator's vision is impaired or obscured and to be on-hand in case of emergency.

(i) Second-crew persons shall be properly trained in their second-person required skills.

(ii) The second crew member shall be close enough to the machine in operation to be aware of any emergency, if one arises, and to assure the machine is operated with necessary and appropriate signals to the operator.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 95-17-036, § 296-155-525, filed 8/9/95, effective 9/25/95. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-525, filed 1/10/91, effective 2/12/91; Order 76-29, § 296-155-525, filed 9/30/76; Order 74-26, § 296-155-525, filed 5/7/74, effective 6/6/74.]

WAC 296-155-527 Appendix A to WAC 296-155-525. Due to crane design configuration to maintain mobility, sheave diameters and rope, design factors are limited. Because of these limited design parameters, inspection to detect deterioration in accordance with subsections below and timely replacement are essential.

(1) Frequent inspection.

(a) All running ropes in service should be visually inspected once each working day. A visual inspection shall consist of observation of all rope which can reasonably be expected to be in use during the day's operations. These visual observations should be concerned with discovering gross damage, such as listed below, which may be an immediate hazard:

(i) Distortion of the rope such as kinking, crushing, unstranding, birdcaging, main strand displacement, or core protrusion. Loss of rope diameter in a short rope length or unevenness of outer strands should provide evidence that the rope or ropes must be replaced.

(ii) General corrosion.

(iii) Broken or cut strands.

(iv) Number, distribution and type of visible broken wires. (See subsection below for further guidance.)

(v) Core failure in rotation resistant ropes. When such damage is discovered the rope shall be either removed from service or given an inspection as detailed in periodic inspection.

(b) Care shall be taken when inspecting sections of rapid deterioration such as flange points, crossover points and repetitive pickup points on drums.

(c) Care shall be taken when inspecting certain ropes such as the following:

(i) Rotation resistant ropes, because of their higher susceptibility to damage and increased deterioration when working on equipment with limited design parameters. The internal deterioration of rotation resistant ropes may not be readily observable.

(ii) Boom hoist ropes, because of the difficulties of inspection and the important nature of these ropes.

(2) Periodic inspection.

(a) The inspection frequency shall be determined by a qualified person and shall be based on such factors as expected rope life as determined by experience on the particular installation or similar installations, severity of environment, percentage of capacity lifts, frequency rates of operation, and exposure to shock loads. Inspections need not be at equal calendar intervals and should be more frequent as the rope approaches the end of its useful life. This inspection shall be performed at least annually.

(b) Periodic inspections shall be performed by a qualified person. This inspection shall cover the entire length of rope. Only the surface wires of the rope need be inspected. No attempt should be made to open the rope. Any deterioration resulting in an appreciable loss of original strength, such as described below, shall be noted and determination made as to whether further use of the rope would constitute a hazard:

(i) Points listed in subsection (1) of this section (Frequent inspection).

(ii) Reduction of rope diameter below nominal diameter due to loss of core support, internal or external corrosion, or wear of outside wires.

(iii) Severely corroded or broken wires at end connections.

(c) Care shall be taken when inspecting sections of rapid deterioration, such as the following:

(i) Sections in contact with saddles, equalizer sheaves, or other sheaves where rope travel is limited;

(ii) Sections of the rope at or near terminal ends where corroded or broken wires may protrude.

(3) Rope replacement.

(a) No precise rules can be given for determination of the exact time for replacement of rope, since many variable factors are involved. Continued use in this respect depends largely upon good judgment by an appointed or authorized

person in evaluating remaining strength in a used rope after allowance for deterioration disclosed by inspection. Continued rope operations depends upon this remaining strength.

(b) Conditions such as the following shall be sufficient reason for questioning continued use of the rope or increasing the frequency of inspection:

(i) In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay (for special conditions relating to rotation resistant rope refer to paragraph 5-3.2.1.1 (d)(1)(b) ANSIASME B30.5 1989).

(ii) One outer wire broken at the point of contact with the core of the rope which has worked its way out of the rope structure and protrudes or loops out from the rope structure. Additional inspection of this section is required.

(iii) Wear of one-third the original diameter of outside individual wires.

(iv) Kinking, crushing, birdcaging, or any other damage resulting in distortion of the rope structure.

(v) Evidence of any heat damage from any cause.

(vi) Reductions from nominal diameter of more than:

(A) 1/64 in. (0.4 mm) for diameters up to and including 5/16 in. (8.0 mm);

(B) 1/32 in. (0.8 mm) for diameters 3/8 in. (9.5 mm) to and including 1/2 in. (13.0 mm);

(C) 3/64 in. (1.2 mm) for diameters 9/16 in. (14.5 mm) to and including 3/4 in. (19.0 mm);

(D) 1/16 in. (1.6 mm) for diameters 7/8 in. (22.0 mm) to and including 1 1/8 in. (29.0 mm);

(E) 3/32 in. (2.4 mm) for diameters 1 1/4 in. (32.0 mm) to and including 1 1/2 in. (38.0 mm).

(vii) In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.

(c) Replacement rope shall have a strength rating at least as great as the original rope furnished or recommended by the crane manufacturer. Any deviation from the original size, grade, or construction shall be specified by a rope manufacturer, the crane manufacturer or a qualified person.

(d) Rope not in regular use. All rope which has been idle for a period of a month or more due to shutdown or storage of a crane on which it is installed shall be given an inspection before it is placed in service. This inspection shall be for all types of deterioration and shall be performed by an appointed or authorized person.

(e) Inspection records:

(i) Frequent inspection; no records required.

(ii) Periodic inspection: In order to establish data as a basis for judging the proper time for replacement, a dated report of rope condition at each periodic inspection shall be kept on file. This report shall cover points of deterioration. If the rope is replaced only that part need be recorded.

(f) A long-range inspection program should be established and should include records on the examination of ropes removed from service so that a relationship can be established between visual observation and actual condition of the internal structure.

(4) Rope maintenance.

(a) Rope should be stored to prevent damage or deterioration.

(b) Unreeling or uncoiling of rope shall be done as recommended by the rope manufacturer and with care to avoid kinking or inducing a twist.

(c) Before cutting a rope, seizings shall be placed on each side of the place where the rope is to be cut to prevent unlaying of the strands. On preformed rope, one seizing on each side of the cut is required. On nonpreformed ropes of 7/8 in. (22 mm) diameter or smaller, two seizings on each side of the cut are required, and for nonpreformed rope of 1 in. (26 mm) diameter or larger, three seizings on each side of the cut are required.

(d) During installation, care should be exercised to avoid dragging of the rope in dirt or around objects which will scrape, nick, crush, or induce sharp bends in it.

(e) Rope should be maintained in a well lubricated condition. It is important that lubricant applied as part of a maintenance program shall be compatible with the original lubricant, and to this end, the rope manufacturer should be consulted; lubricant applied shall be of the type which does not hinder visual inspection. Those sections of rope which are located over sheaves or otherwise hidden during inspection and maintenance procedures require special attention when lubricating rope. The object of rope lubrication is to reduce internal friction and to prevent corrosion.

(f) When an operating rope shows greater wear at well-defined localized areas than on the remainder of the rope, rope life can be extended (in cases where a reduced rope length is adequate) by cutting off a section at the worn end, and thus shifting the wear to different areas of the rope.

(5) Operating near electric power lines:

(a) Cranes shall be operated so that no part of the crane or load enters into the danger zone.

Exceptions:

The danger zone may be entered if the electrical distribution and transmission lines have been de-energized and visibly grounded at the point of work; or the danger zone may be entered if insulating barriers (not a part of nor an attachment to the crane) have been erected to prevent physical contact with the lines.

(i) For lines rated 50 kV. or below, minimum clearance between the lines and any part of the crane or load (including handling appendages) shall be 10 feet (3 m).

(ii) Caution shall be exercised when working near overhead lines because they can move horizontally or vertically due to wind, moving the danger zone to new positions.

(iii) While in transit with no load and boom lowered, the clearance shall be as specified in WAC 296-155-525 (3)(e).

(iv) A qualified signal person shall be assigned to observe the clearance when the crane moves to within a boom's length of the limits specified in WAC 296-155-525 (3)(e). The operator is not in the best position to judge distance between the power line and the crane or its protuberances.

(b) If cage-type boom guards, insulating links, or proximity warning devices are used on cranes, such devices shall not be a substitute for the requirements of WAC 296-155-525 (3)(e), even if such devices are required by law or regulation. In view of the complex, invisible, and lethal nature of the electrical hazard involved, and to lessen the potential of false security, limitations of such devices, if used, shall be understood by operating personnel and tested in the manner and intervals prescribed by the manufacturer of the device. Com-

pliance with WAC 296-155-525 (3)(e) is the recommended practice of this regulation in determining permissible proximity of the crane and its protuberances, including load, to electrical power lines.

(c) Before the commencement of operations near electrical lines, the person responsible for the job shall notify the owners of the lines or their authorized representatives, provide them with all pertinent information, and request their cooperation.

(d) Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities verify that it is not an energized line.

(e) Exceptions to this procedure, if approved by the owner of the electrical lines, may be granted by the administrative or regulatory authority if the alternate procedure provides protection and is set forth in writing.

(f) Durable signs shall be installed at the operator's station and on the outside of the crane warning that electrocution or serious bodily injury may occur unless a minimum clearance of 10 feet (3 m) is maintained between the crane or the load being handled and energized power lines. Greater clearances are required because of higher voltage as stated in WAC 296-155-525 (3)(e). These signs shall be revised when local jurisdiction requires greater clearances.

(6) Site preparation and erection.

(a) All load bearing foundations, supports, and rail tracks shall be constructed or installed to support the crane loads and to transmit them to the soil or other support medium. In addition to supporting vertical load, foundations and supports, rail supports excepted, should be designed to provide a moment resisting overturning equal to a minimum of 150% of the maximum crane overturning moment.

(b) Rails should be level and straight, unless specifically designed for curves or grades, and properly spaced for the crane trucks in accordance with the manufacturer's specifications. The track and support system should have sufficient rigidity to limit dynamic oscillations and deviations from plumb.

(c) Rails shall be securely attached to the supporting surface in a manner capable of resisting the horizontal and vertical loads specified by the manufacturer. When applicable, provisions should be made for thermal expansion and contraction.

(d) Splices in rail tracks (bolted or welded) shall have smooth joints.

(e) When required, a designated portion of the track should be arranged and constructed as an out-of-service parking area complete with means needed for supporting the crane against storm wind effects and anchoring it against unwanted movement along the track; the parking track should be in place before erection commences.

(f) Rails shall be electrically grounded when they carry cranes electrically powered from an outside source.

(g) Both ends of all tracks shall be provided with stops or buffers adjusted for simultaneous contact with both sides of the travel base.

(h) When more than one crane will be operating on a run of track, particular consideration should be given to the number and disposition of parking areas.

(i) The hazard of earthquake effects appropriated to the site or zone should be considered.

(j) The crane manufacturer shall provide maximum resulting loads at the base of the crane, or wheel loads, for use in design of the supports.

(7) General erection requirements.

(a) When cranes are erected, the manufacturer's or a qualified person's written erection instructions and a list of the weights of each component to be erected shall be at the site.

(b) Cranes shall be erected in accordance with the crane manufacturer's or a qualified person's recommendations. Erection shall be performed under the supervision of a qualified person.

(c) Procedures shall be established before erection work commences to implement the erection instructions and to adapt them to the particular needs of the site. The need for temporary guying and bracing during erection shall be established.

(d) Before crane components are erected, they shall be visually inspected for damage. Damaged members shall not be erected until repaired in accordance with the manufacturer's or qualified person's instructions, or replaced.

(e) Slings and lifting accessories shall be selected and arranged to avoid damaging or marring crane members during erection.

(f) Wind velocity at the site at the time of erection should be considered as a limiting factor that could require suspending the erection operation.

(g) Crane towers shall be erected plumb to a tolerance that is specified by the manufacturer.

(h) Cranes required to weathervane when out-of-service shall be installed with clearance for the boom and superstructure to swing a full 360° arc without striking a fixed object or other crane.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 97-11-055, § 296-155-527, filed 5/20/97, effective 8/1/97; 95-17-036, § 296-155-527, filed 8/9/95, effective 9/25/95.]

WAC 296-155-528 Crane or derrick suspended personnel platforms. (1) Scope, application, and definitions.

(a) Scope and application. This standard applies to the design, construction, testing, use and maintenance of personnel platforms, and the hoisting of personnel platforms on the load lines of cranes or derricks.

(b) Definitions. For the purposes of this section, the following definitions apply:

(i) "Failure" means load refusal, breakage, or separation of components.

(ii) "Hoist" (or hoisting) means all crane or derrick functions such as lowering, lifting, swinging, booming in and out or up and down, or suspending a personnel platform.

(iii) "Load refusal" means the point where the ultimate strength is exceeded.

(iv) "Maximum intended load" means the total load of all employees, tools, materials, and other loads reasonably anticipated to be applied to a personnel platform or personnel platform component at any one time.

(v) "Runway" means a firm, level surface designed, prepared, and designated as a path of travel for the weight and

configuration of the crane being used to lift and travel with the crane suspended platform. An existing surface may be used as long as it meets these criteria.

(2) General requirements. The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold, would be more hazardous, or is not possible because of structural design or worksite conditions.

(3) Cranes and derricks.

(a) Operational criteria.

(b) Hoisting of the personnel platform shall be performed in a slow, controlled, cautious manner with no sudden movements of the crane or derrick, or the platform.

(c) Load lines shall be capable of supporting, without failure, at least seven times the maximum intended load, except that where rotation resistant rope is used, the lines shall be capable of supporting without failure, at least ten times the maximum intended load. The required design factor is achieved by taking the current safety factor of 3.5 (required under WAC 296-155-525 (4)(b)) and applying the fifty percent derating of the crane capacity which is required by (f) of this subsection.

(d) Load and boom hoist drum brakes, swing brakes, and locking devices such as pawls or dogs shall be engaged when the occupied personnel platform is in a stationary working position.

(e) The crane shall be uniformly level within one percent of level grade and located on firm footing. Cranes equipped with outriggers shall have them all fully deployed following manufacturer's specifications, insofar as applicable, when hoisting employees.

(f) The total weight of the loaded personnel platform and related rigging shall not exceed fifty percent of the rated capacity for the radius and configuration of the crane or derrick.

(g) The use of machines having live booms (booms in which lowering is controlled by a brake without aid from other devices which slow the lowering speeds) is prohibited.

(h) Multiple-part line block: When a multiple-part line block is in use, a substantial strap shall be used between the crane hook and common ring, shackle, or other equivalent device, to eliminate employee exposure to the lines running through the block, and to the block itself.

(4) Instruments and components.

(a) Cranes and derricks with variable angle booms shall be equipped with a boom angle indicator, readily visible to the operator.

(b) Cranes with telescoping booms shall be equipped with a device to indicate clearly to the operator, at all times, the boom's extended length, or an accurate determination of the load radius to be used during the lift shall be made prior to hoisting personnel.

(c) A positive acting device shall be used which prevents contact between the load block or overhaul ball and the boom tip (anti-two-blocking device), or a system shall be used which deactivates the hoisting action before damage occurs in the event of a two-blocking situation (two block damage prevention feature).

(d) The load line hoist drum shall have a system or device on the power train, other than the load hoist brake, which regulates the lowering rate of speed of the hoist mechanism (controlled load lowering). Free fall is prohibited.

(5) Rigging.

(a) Lifting bridles on box-type platforms shall consist of four legs of equal length, with one end securely shackled to each corner of the platform and the other end securely attached to a common ring, shackle, or other equivalent device to accommodate the crane hook, or a strap to the crane hook.

(b) Shackle bolts used for rigging of personnel platforms shall be secured against displacement.

(c) A substantial safety line shall pass through the eye of each leg of the bridle adjacent to the common ring, shackle, or equivalent device.

(d) Securely fastened with a minimum amount of slack to the lift line above the headache ball or to the crane hook itself.

(e) All eyes in wire rope slings shall be fabricated with thimbles.

(f) Wire rope, shackles, rings, master links, and other rigging hardware must be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation resistant wire rope is used for slings, they shall be capable of supporting without failure at least ten times the maximum intended load.

(g) Hooks on headache ball assemblies, lower load blocks, or other attachment assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening. Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used.

(h) Bridles and associated rigging for attaching the personnel platform to the hoist line shall be used only for the platform and the necessary employees, their tools and the materials necessary to do their work, and shall not be used for any other purpose when not hoisting personnel.

(6) Personnel platforms - design criteria.

(a) The personnel platform and suspension system shall be designed by a qualified engineer or a qualified person competent in structural design.

(b) The suspension system shall be designed to minimize tipping of the platform due to movement of employees occupying the platform.

(c) The personnel platform itself, except the guardrail system and body harness anchorages, shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load based on a minimum allowance of five hundred pounds for the first person with light tools, and an additional two hundred fifty pounds for each additional person.

(d) Criteria for guardrail systems contained in chapter 296-155 WAC, Part K and body harness anchorages are contained in chapter 296-155 WAC, Part C-1.

(e) The personnel platform shall be conspicuously posted with a plate or other permanent marking which indicates the weight of the platform and its rated load capacity or maximum intended load.

(7) Platform specifications.

(a) Each personnel platform shall be equipped with a guardrail system which meets the requirements of chapter 296-155 WAC, Part K and, shall be enclosed at least from the toeboard to mid-rail with either solid construction or expanded metal having openings no greater than one-half inch (1.27 cm).

(b) A grab rail shall be installed inside the entire perimeter of the personnel platform.

(c) Access gates, if installed, shall not swing outward during hoisting.

(d) Access gates, including sliding or folding gates, shall be equipped with a restraining device to prevent accidental opening.

(e) Headroom shall be provided which allows employees to stand upright in the platform.

(f) In addition to the use of hard hats, employees shall be protected by overhead protection on the personnel platform when employees are exposed to falling objects.

(g) All rough edges exposed to contact by employees shall be surfaced or smoothed in order to prevent injury to employees from punctures or lacerations.

(h) All welding of the personnel platform and its components shall be performed by a qualified welder familiar with the weld grades, types, and material specified in the platform design.

(i) Occupants of all personnel platforms shall wear a safety belt or harness and lanyard which meets the requirements of chapter 296-155 WAC, Part C-1.

(j) Box-type platform: The workers lanyard shall be secured to an anchorage within the platform meeting the requirements of chapter 296-155 WAC, Part C-1.

(k) Rescue platform:

(i) If the platform is used as a rescue vehicle, the injured worker shall be strapped into the stretcher or basket.

(ii) The basket shall then be secured by lanyard to an anchorage within the platform meeting the requirements of chapter 296-155 WAC, Part C-1.

(l) Boatswains chair: The workers lanyard shall be secured to the lift line above the headache ball or to the crane hook itself.

(m) Barrel-type platform:

(i) The workers lanyard shall be secured to the lift line above the headache ball or to the crane hook itself.

(ii) A solid bar or rod shall be substantially attached in a rigid position to the bottom or side of the platform.

(iii) The bottom of the barrel-type platform shall be of a convex shape to cause the platform to lay on its side when lowered to the ground or floor.

(iv) The bar or rod shall extend a minimum of eight feet above the floor of the platform.

(v) Workers shall enter and exit from barrel-type platforms only when they are in an upright position, stable, and securely attached to the load line.

(vi) The employer shall use methods or devices which allow employees to safely enter or exit barrel-type platforms.

(8) Personnel platform loading.

(a) The personnel platform shall not be loaded in excess of its rated load capacity.

(b) The number of employees occupying the personnel platform shall not exceed the number required for the work being performed.

(c) Personnel platforms shall be used only for employees, their tools, and the materials necessary to do their work, and shall not be used to hoist only materials or tools when not hoisting personnel.

(d) Materials and tools for use during a personnel lift shall be secured to prevent displacement.

(e) Materials and tools for use during a personnel lift shall be evenly distributed within the confines of the platform while the platform is suspended.

(9) Trial lift, inspection, and proof testing.

(a) A trial lift with the unoccupied personnel platform loaded at least to the anticipated liftweight shall be made from ground level, or any other location where employees will enter the platform, to each location at which the personnel platform is to be hoisted and positioned. This trial lift shall be performed immediately prior to placing personnel on the platform. The operator shall determine that all systems, controls, and safety devices are activated and functioning properly; that no interferences exist; and that all configurations necessary to reach those work locations will allow the operator to remain under the fifty percent limit of the hoist's rated capacity. Materials and tools to be used during the actual lift can be loaded in the platform, as provided in subsection (8)(d) and (e) of this section for the trial lift. A single trial lift may be performed at one time for all locations that are to be reached from a single set-up position.

(b) The trial lift shall be repeated prior to hoisting employees whenever the crane or derrick is moved and set up in a new location or returned to a previously used location. Additionally, the trial lift shall be repeated when the lift route is changed unless the operator determines that the route change is not significant (i.e., the route change would not affect the safety of hoisted employees).

(c) After the trial lift, and just prior to hoisting personnel, the platform shall be hoisted a few inches and inspected to ensure that it is secure and properly balanced. Employees shall not be hoisted unless the following conditions are determined to exist:

(i) Hoist ropes shall be free of kinks;

(ii) Multiple part lines shall not be twisted around each other;

(iii) The primary attachment shall be centered over the platform; and

(iv) The hoisting system shall be inspected if the load rope is slack to ensure all ropes are properly seated on drums and in sheaves.

(d) A visual inspection of the crane or derrick, rigging, personnel platform, and the crane or derrick base support or ground shall be conducted by a competent person immediately after the trial lift to determine whether the testing has exposed any defect or produced any adverse effect upon any component or structure.

(e) Any defects found during inspections which create a safety hazard shall be corrected before hoisting personnel.

(f) At each job site, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging shall be proof tested to one hundred

twenty-five percent of the platform's rated capacity by holding it in a suspended position for five minutes with the test load evenly distributed on the platform (this may be done concurrently with the trial lift). After proof testing, a competent person shall inspect the platform and rigging. Any deficiencies found shall be corrected and another proof test shall be conducted. Personnel hoisting shall not be conducted until the proof testing requirements are satisfied.

(10) Work practices.

(a) Employees shall keep all parts of the body inside the platform during raising, lowering, and positioning. This provision does not apply to an occupant of the platform performing the duties of a signal person.

(b) Before employees exit or enter a hoisted personnel platform that is not landed, the platform shall be secured to the structure where the work is to be performed, unless securing to the structure creates an unsafe situation.

(c) Tag lines shall be used unless their use creates an unsafe condition.

(d) The crane or derrick operator shall remain at the controls at all times when the crane engine is running and the platform is occupied.

(e) Hoisting of employees shall be promptly discontinued upon indication of any dangerous weather conditions or other impending danger.

(f) Employees being hoisted shall remain in continuous sight of and in direct communication with the operator or signal person. In those situations where direct visual contact with the operator is not possible, and the use of a signal person would create a greater hazard for that person, direct communication alone such as by radio may be used.

(g) Hand signals to the operator shall be in accordance with WAC 296-155-525 (2)(c).

(h) Except over water, employees occupying the personnel platform shall use a full body harness system with lanyard appropriately attached to the lower load block or overhaul ball, or to a structural member within the personnel platform capable of supporting a fall impact for employees using the anchorage as specified in chapter 296-155 WAC, Part C-1. When working over water, the requirements of WAC 296-155-235 shall apply.

No lifts shall be made on another of the crane's or derrick's load lines while personnel are suspended on a platform.

(11) Traveling.

(a) Hoisting of employees while the crane is traveling is prohibited, except for portal, tower and locomotive cranes, or where the employer demonstrates that there is no less hazardous way to perform the work.

(b) Under any circumstances where a crane would travel while hoisting personnel, the employer shall implement the following procedures to safeguard employees:

(i) Crane travel shall be restricted to a fixed track or runway;

(ii) Travel shall be limited to the load radius of the boom used during the lift; and

(iii) The boom must be parallel to the direction of travel.

(c) A complete trial run shall be performed to test the route of travel before employees are allowed to occupy the platform. This trial run can be performed at the same time as

the trial lift required by subsection (9)(a) of this section which tests the route of the lift.

(d) If travel is done with a rubber tired-carrier, the condition and air pressure of the tires shall be checked. The chart capacity for lifts on rubber shall be used for application of the fifty percent reduction of rated capacity. Notwithstanding subsection (3)(e) of this section, outriggers may be partially retracted as necessary for travel.

(12) Prelift meeting.

(a) A meeting attended by the crane or derrick operator, signal person(s) (if necessary for the lift), employee(s) to be lifted, and the person responsible for the task to be performed shall be held to review the appropriate requirements of this section and the procedures to be followed.

(b) This meeting shall be held prior to the trial lift at each new work location, and shall be repeated for any employees newly assigned to the operation.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-528, filed 2/13/98, effective 4/15/98.]

WAC 296-155-530 Material hoists, personnel hoists, and elevators. (1) General requirements.

(a) The employer shall comply with the manufacturer's specifications and limitations applicable to the operation of all hoists and elevators. Where the manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a professional engineer competent in the field.

(b) The employer shall ensure that no person shall enter a hoistway, elevator shaft, or similar enclosure in which the hoisting apparatus or vehicle is installed and functioning unless the power source operating those systems is locked out in accordance with WAC 296-155-429.

(c) Rated load capacities, recommended operating speeds, and special hazard warning or instructions shall be posted on cars and platforms.

(d) Wire rope shall be removed from service when any of the following conditions exists:

(i) In hoisting ropes, six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay;

(ii) Abrasion, scrubbing, flattening, or peening, causing loss of more than one-third of the original diameter of the outside wires;

(iii) Evidence of any heat damage resulting from a torch or any damage caused by contact with electrical wires;

(iv) Reduction from nominal diameter of more than three sixty-fourths inch for diameters up to and including three-fourths inch; one-sixteenth inch for diameters seven-eighths to 1 1/8 inches; and three thirty-seconds inch for diameters 1 1/4 to 1 1/2 inches.

(e) Hoisting ropes shall be installed in accordance with the wire rope manufacturer's recommendations.

(f) The installation of live booms on hoists is prohibited.

(g) The use of endless belt-type man lifts on construction shall be prohibited.

(h) Employees shall not be permitted to ride on top of material hoists, personnel hoists or permanent elevators except for purposes of inspection, maintenance, elevator installation or dismantling work.

(2) Material hoists, (a)(i) Operating rules shall be established and posted at the operator's station of the hoist. Such rules shall include signal system and allowable line speed for various loads. Rules and notices shall be posted on the car frame or crosshead in a conspicuous location, including the statement "No riders allowed."

(ii) No person shall be allowed to ride on material hoists except for the purposes of inspection and maintenance.

(b) All entrances of the hoistways shall be protected by substantial gates or bars which shall guard the full width of the landing entrance. All hoistway entrance bars and gates shall be painted with diagonal contrasting colors, such as black and yellow stripes.

(i) Bars shall be not less than 2- by 4-inch wooden bars or the equivalent, located 2 feet from the hoistway line. Bars shall be located not less than 36 inches nor more than 42 inches above the floor.

(ii) Gates or bars protecting the entrances to hoistway shall be equipped with a latching device.

(c) Overhead protective covering of two-inch planking, 3/4-inch plywood or other solid material of equivalent strength shall be provided on the top of every material hoist cage or platform to prevent objects falling on the workers loading or unloading the hoist.

(i) The protective covering on the top of the cage or platform may be made in hinged sections that may be raised when hoisting long material.

(ii) When using a cage or platform for long material, the several pieces of the material shall be securely fastened together and made fast to the cage or platform, so that no part of the load can fall or project beyond the sides of the cage or platform.

(d) The operator's station of a hoisting machine shall be provided with overhead protection equivalent to tight planking not less than 2 inches thick. The support for the overhead protection shall be of equal strength.

(e) Hoist towers may be used with or without an enclosure on all sides. However, whichever alternative is chosen, the following applicable conditions shall be met:

(i) When a hoist tower is enclosed, it shall be enclosed on all sides for its entire height with a screen enclosure of 1/2-inch mesh, No. 18 U.S. gauge wire or equivalent, except for landing access.

(ii) When a hoist tower is not enclosed, the hoist platform or car shall be totally enclosed (caged) on all sides for the full height between the floor and the overhead protective covering with 1/2-inch mesh of No. 14 U.S. gauge wire or equivalent. The hoist platform enclosure shall include the required gates for loading and unloading. A 6-foot high enclosure shall be provided on the unused sides of the hoist tower at ground level.

(f) Car arresting devices shall be installed to function in case of rope failure.

(g) All material hoist towers shall be designed by a licensed professional engineer.

(h) All material hoists shall conform to the requirements of ANSI A10.5-1969, Safety Requirements for Material Hoists.

(3) Personnel hoists.

(a) Personnel hoists shall be provided for access and egress on all multi story buildings where vertical travel exceeds sixty feet from a ground level access point.

(b) Hoist towers outside the structure shall be enclosed for the full height on the side or sides used for entrance and exit to the structure. At the lowest landing, the enclosure on the sides not used for exit or entrance to the structure shall be enclosed to a height of at least 10 feet. Other sides of the tower adjacent to floors or scaffold platforms shall be enclosed to a height of 10 feet above the level of such floors or scaffolds.

(c) Towers inside of structures shall be enclosed on all four sides throughout the full height.

(d) Towers shall be anchored to the structure at intervals not exceeding 25 feet. In addition to tie-ins, a series of guys shall be installed. Where tie-ins are not practical the tower shall be anchored by means of guys made of wire rope at least one-half inch in diameter, securely fastened to anchorages to ensure stability.

(e) Hoistway doors or gates shall be not less than 6 feet 6 inches high and shall be provided with mechanical locks which cannot be operated from the landing side, and shall be accessible only to persons on the car.

(f) Cars shall be permanently enclosed on all sides and the top, except sides used for entrance and exit, which have car gates or doors.

(g) A door or gate shall be provided at each entrance to the car which shall protect the full width and height of the car entrance opening.

(h) Overhead protective covering of 2-inch planking, 3/4-inch plywood or other solid material of equivalent strength shall be provided on the top of every personnel hoist.

(i) Doors or gates shall be provided with electric contacts which do not allow movement of the hoist when door or gate is open.

(j) A signal device shall be installed in the elevator car and only operated by an attendant who shall give the signals for operation, when transporting workers.

(k) An electrical push button signalling device or other approved signalling system shall be provided at each floor landing connected to an annunciator in the car. The signal code shall be posted adjacent to the signal device at each and every work level and at operator's work level. All wording shall be black on a white card, in large clear letters.

(l) The elevator machine and controls shall be housed in as a protection against accidents and the weather, and the door kept locked against unauthorized entrance when operator is not in attendance.

(m) Safeties shall be capable of stopping and holding the car and rated load when traveling at governor tripping speed.

(n) Cars shall be provided with a capacity and data plate secured in a conspicuous place on the car or crosshead.

(o) Internal combustion engines shall not be permitted for direct drive.

(p) Normal and final terminal stopping devices shall be provided.

(q) An emergency stop switch shall be provided in the car and marked "stop."

(r) Ropes:

(i) The minimum number of hoisting ropes used shall be three for traction hoists and two for drum-type hoists.

(ii) The minimum diameter of hoisting and counter-weight wire ropes shall be 1/2-inch.

(iii) Safety factors:

MINIMUM FACTORS OF SAFETY FOR SUSPENSION WIRE ROPES

Rope speed in feet per minute:	Minimum factor of safety
50	7.60
75	7.75
100	7.95
125	8.10
150	8.25
175	8.40
200	8.60
225	8.75
250	8.90
300	9.20
350	9.50
400	9.75
450	10.00
500	10.25
550	10.45
600	10.70

(s) Following assembly and erection of hoists, and before being put in service, an inspection and test of all functions and safety devices shall be made under the supervision of a competent person. A similar inspection and test is required following major alteration of an existing installation. All hoists shall be inspected and tested at not more than 3-month intervals. Records shall be maintained and kept on file for the duration of the job.

(t) All personnel hoists used by employees shall be constructed of materials and components which meet the specifications for materials, construction, safety devices, assembly, and structural integrity as stated in the American National Standard A10.4-1963, Safety Requirements for Workmen's Hoists. The requirements of this subdivision do not apply to cantilever type personnel hoists.

(u) Wire rope shall be taken out of service when any of the following conditions exist:

(i) In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay;

(ii) Wear of one-third the original diameter of outside individual wires. Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure;

(iii) Evidence of any heat damage from any cause;

(iv) Reductions from nominal diameter of more than three-sixty-fourths inch for diameters to and including three-fourths inch, one sixteenth inch for diameter seven-eighths inch to 1 1/8 inches inclusive, three-thirty-seconds inch for diameters 1 1/4 to 1 1/2 inches inclusive;

(v) In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.

(v)(i) Personnel hoists used in bridge tower construction shall be approved by a registered professional engineer and erected under the supervision of a qualified engineer competent in this field.

(ii) When a hoist tower is not enclosed, the hoist platform or car shall be totally enclosed (caged) on all sides for the full height between the floor and the overhead protective covering with 3/4-inch mesh of No. 14 U.S. gauge wire or equivalent. The hoist platform enclosure shall include the required gates for loading and unloading.

(iii) These hoists shall be inspected and maintained on a weekly basis. Whenever the hoisting equipment is exposed to winds exceeding 35 miles per hour it shall be inspected and put in operable condition before reuse.

(4) Permanent elevators under the care and custody of the employer and used by employees for work covered by this act shall comply with the requirements of American National Standards Institute, A17.1-1971, and inspected in accordance with A17.2-1960 with addenda A17.2a-1965, A17.2b-1967.

Note: For additional information refer to chapter 296-100 WAC, safety requirements for material hoists.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-530, filed 7/20/94, effective 9/20/94; 91-03-044 (Order 90-18), § 296-155-530, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-530, filed 1/21/86; Order 74-26, § 296-155-530, filed 5/7/74, effective 6/6/74.]

WAC 296-155-535 Base-mounted drum hoists. (1) General requirements.

(a) Exposed moving parts such as gears, projecting screws, setscrews, chain, cables, chain sprockets, and reciprocating or rotating parts, which constitute a hazard, shall be guarded.

(b) All controls used during the normal operation cycle shall be located within easy reach of the operator's station.

(c) Electric motor operated hoists shall be provided with:

(i) A device to disconnect all motors from the line upon power failure and not permit any motor to be restarted until the controller handle is brought to the "off" position;

(ii) Where applicable, an overspeed preventive device;

(iii) A means whereby remotely operated hoists stop when any control is ineffective.

(d) All base-mounted drum hoists in use shall meet the applicable requirements for design, construction, installation, testing, inspection, maintenance, and operation, as prescribed by the manufacturer.

(2) Specific requirements. (Reserved.)

[Order 74-26, § 296-155-535, filed 5/7/74, effective 6/6/74.]

WAC 296-155-540 Overhead hoists. (1) General requirements.

(a) The safe working load of the overhead hoist, as determined by the manufacturer, shall be indicated on the hoist, and this safe working load shall not be exceeded.

(b) The supporting structure to which the hoist is attached shall have a safe working load equal to that of the hoist.

(c) The support shall be arranged so as to provide for free movement of the hoist and shall not restrict the hoist from lining itself up with the load.

(d) The hoist shall be installed only in locations that will permit the operator to stand clear of the load at all times.

(e) Air hoists shall be connected to an air supply of sufficient capacity and pressure to safely operate the hoist. All

air hoses supplying air shall be positively connected to prevent their becoming disconnected during use.

(f) All overhead hoists in use shall meet the applicable requirements for construction, design, installation, testing, inspection, maintenance, and operation, as prescribed by the manufacturer.

(2) Specific requirements. (Reserved.)

[Order 74-26, § 296-155-540, filed 5/7/74, effective 6/6/74.]

WAC 296-155-545 Conveyors. (1) All conveyors in use shall meet the applicable requirements for design, construction, inspection, testing, maintenance, and operation, as prescribed in ANSI B20.1-1976, Safety Code for Conveyors, Cableways, and Related Equipment.

(2) Starting precautions.

(a) When the entire length of a conveyor is visible from the starting switch, the operator shall visually check to make certain that all persons are in the clear before starting the conveyor.

(b) When the entire length of the conveyor is not visible from the starting switch, a positive audible or visible warning system shall be installed and operated to warn persons that the conveyor will be started.

(c) All reasonable precautions shall be taken by the operator prior to starting a conveyor, to assure that no person is in a hazardous location where they may be injured when the conveyor is started.

(3) Riding and walking on conveyors.

(a) Riding on conveyor chains, belt, or bucket elevators shall be prohibited.

(b) Persons shall not be allowed to walk on conveyors except for emergency purposes and then only after the conveyor has been de-energized and the person can do so safely.

(c) Riding of conveyors shall only be permitted on the manlift steps and platforms with handholds attached and other safety factors as specified in chapter 296-82 WAC, Safety standards for existing belt manlifts.

(4) Stop controls.

(a) Means for stopping the motor or engine of a conveyor shall be provided at the operator's station.

(b) If the operator's station is at a remote point, similar provisions for stopping the motor or engine shall be provided at the motor or engine location.

(5) Emergency controls. Emergency stop switches shall be arranged so that the conveyor cannot be started again until the actuating stop switch has been reset to running or "on" position.

(6) Screw type conveyors. Screw or auger type conveyors shall be guarded to prevent employee contact with turning flights.

(7) Overhead conveyors.

(a) Where a conveyor passes over work areas, aisles, or thoroughfares, guards shall be provided to protect persons required to work below the conveyors.

(b) Where a conveyor crosses over an aisle or passageway, it shall be conspicuously marked by suitable signs, as required by Part E of this chapter.

(c) When the return strand of a conveyor operates within seven feet of the floor there shall be a trough provided of sufficient strength to carry the weight resulting from a broken

chain. If the strands are over a passageway, a means shall be provided to catch and support the ends of the chain in the event of a break.

(8) Emergency stop.

(a) Conveyors shall be provided with an emergency stopping device (panic-type) which can be reached from the conveyor.

(b) The emergency stopping device shall be located near the material entrance and shall stop the conveyor a sufficient distance away from the hazard to prevent injury.

(c) Where the conveyor leading into such equipment is under constant control of an operator who has full view of the material entrance who is located or restrained where they cannot possibly fall onto the conveyor an emergency stopping device is not mandatory.

(9) Conveyor lockout.

(a) Conveyors shall be locked out with a padlock at any time repair, maintenance, or clean-up work is being performed on the conveyor.

(b) Tags or push-button stops are not acceptable.

(10) Where conveyors are in excess of seven feet in height, means shall be provided to safely permit essential inspection and maintenance operations.

(11) Conveyor repair.

(a) Any part showing signs of significant wear shall be inspected carefully and replaced prior to reaching a condition where it may create a hazard.

(b) Replacement parts shall be equal to or exceed the manufacturer's specifications.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-545, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-545, filed 1/21/86; Order 74-26, § 296-155-545, filed 5/7/74, effective 6/6/74.]

WAC 296-155-550 Aerial cableways. (1) Cableways shall be designed to withstand the maximum required load with a safety factor of five (5) on all its parts.

(2) Safety stay lines shall be installed at anchor ends and equal in strength to the cableway.

(3) Where towers are required they shall be securely guyed or constructed to carry the maximum sustained load.

(4) Towers shall be provided with ladderways to facilitate safe access for repairs and inspections.

(5) Towers shall have sufficient elevation to provide substantial clearance for cableway and loads carried over all contemplated work.

(6) Running lines and sheaves, where accessible, shall be guarded.

(7) The carrier, carrier sheaves, bearings, bucket latch and all working parts shall be lubricated and visually inspected daily.

(8) All the wire ropes shall be kept lubricated with proper lubricant.

(9) Daily visual inspection shall be made of the button line, especially at the buttons where abrasion is caused by the carrier rebound. Rubber and steel ferrule shock absorbers shall be placed at each end of buttons.

(10) All loading, unloading and working stations shall be adequately lighted for night operation. Clearance lights shall be installed on all high points under cableway.

[Order 74-26, § 296-155-550, filed 5/7/74, effective 6/6/74.]

(1999 Ed.)

WAC 296-155-555 Gin poles. (1) Gin poles shall be properly guyed according to the type used.

(2) Anchors may be of "dead men" or attached to some permanent stable structure.

(3) When the guy lines are anchored to a permanent structure, the anchors shall be distant at least one-half the height of the pole from its base, and when "dead men" are used, they shall be located a distance from the base at least one and one-half times the height of the pole.

(4) The pole shall be securely fastened at the foot to prevent kicking out during operation.

(5) Gin poles shall be of selected timber, sound and free from knots or other injurious defects.

(6) Allowable loads for spruce timbers used as gin poles. The allowable loads and the limiting lengths given are based on the U.S. Forest Products Laboratory Standard Recommendations for Spruce of Common Grade, based on pin connected ends for columns.

Actual	Length in feet	Allowable load capacity in tons
6" x 6".....	10	10.4
6" x 6".....	15	6.6
6" x 6".....	20	3.7
6" x 6".....	25	2.4
8" x 8".....	20	11.7
8" x 8".....	25	7.5
8" x 8".....	30	5.2
8" x 8".....	33	4.2
10" x 10".....	25	18.2
10" x 10".....	30	12.7
10" x 10".....	35	9.3
10" x 10".....	41	6.6
12" x 12".....	30	26.3
12" x 12".....	35	19.3
12" x 12".....	40	14.8
12" x 12".....	45	11.7
12" x 12".....	50	9.5

(7) When gin poles are spliced to increase their length, the splicing shall be made with heavy planking at least four feet long securely bolted to all four (4) sides of the pole. If splicing planks are spiked, they shall be securely lashed at the same points.

(8) Additional guy lines shall be attached at the point of splice.

[Order 74-26, § 296-155-555, filed 5/7/74, effective 6/6/74.]

WAC 296-155-560 Concrete bucket towers. (1) A concrete bucket tower located inside a structure, and which is three feet or less from any scaffold or the edge of the shaftway or floor opening in which it is installed, shall be enclosed on all sides with heavy wire netting formed of number sixteen U.S. gauge one and one-half inch mesh. Wood slats placed vertically and spaced not more than one and one-half inches apart may be used instead of the netting.

The enclosure shall extend at least eight feet above such scaffold or floor.

(2) A concrete bucket tower located outside a structure shall be enclosed to a height of eight feet at lower landing with heavy wire netting formed of number sixteen U.S. gauge wire one and one-half inch mesh or other suitable material.

(3) Openings with platforms shall be formed at each floor level, and the runway leading to the tower shall be guarded with standard railings and toeboards.

(4) If the bucket is discharged into a chute, the chute shall be substantially constructed of wood or metal and extend from the tower to the point where the concrete is to be poured, or transferred to vehicles or hoppers, and the chute shall be substantially supported.

(5) The pit shall be drained and deep enough so that any spill from the bucket will fall below the blocking on which the bucket rests while being filled.

(6) Persons shall not be allowed to work in the pit without first resting the bucket on strong timbers supported on two sides of the tower.

(7) The bucket tower shall be securely guyed at two or more elevations as may be necessary.

(8) The guide rails shall be carefully aligned and kept in good condition to prevent the bucket being caught or clogged while being hoisted.

(9) The sheaves over which the cable passes shall be firmly secured to overhead sheave beams and supporting frame work and the sheaves shall be kept lubricated.

(10) The hoisting cable shall be frequently inspected and renewed when broken wires or other defects are discovered.

(11) A platform provided with standard railings and toeboards shall be constructed at the point where the concrete is dumped into the chute. A ladder shall be fastened to one side of the tower to enable a person to reach the platform in safety.

(12) Workers shall be prohibited from riding in or on the bucket.

[Order 74-26, § 296-155-560, filed 5/7/74, effective 6/6/74.]

WAC 296-155-565 Hoisting engines. (1) All gearing on hoisting engines shall be enclosed. Steam piping subject to contact shall be insulated and if electrical equipment is used, it shall be grounded.

(2) Hoisting engines shall be of ample capacity and equipped with brakes capable of sustaining one hundred and fifty percent of rated load for stopping and sustaining the maximum load in any position.

(3) Hoisting engines shall be protected against the weather and falling objects by a substantial cover.

(4) All hoisting equipment shall be frequently inspected, and brakes, gears and operating levers kept in working condition.

(5) Guards shall be provided to prevent persons coming in contact with hoisting cables.

(6) Brake drums shall be kept free of oil or grease.

(7) A positive operated pawl shall be used in addition to the brake to hold the load when it is suspended. Counter weight operated dogs are prohibited.

(8) Hoisting engines shall not be set up in the street when it can be avoided; but, if so located, they shall be completely housed.

(9) Only competent personnel shall operate material hoists.

(10) The operator shall not lift a load when a person is on the hoist, and all towers shall be posted to that effect, except as provided in other sections of this part.

(11) The operator shall be notified when any person goes up the tower ladder, or before any work is done on any part of the tower, overhead work, hoist or in the pit.

[Title 296 WAC—p. 2290]

(12) The operator shall make daily inspections of all equipment before starting operations.

(13) When the hoisting engine is located close to the building operation, it shall be covered with a strong plank roof covering to protect the operator from falling objects.

(14) Exhaust steam pipes shall discharge overhead so as not to obstruct the view of the operator or scald persons.

(15) In the operation of hoists, the operator shall always give a warning sign or signal before starting.

(16) When hoisting machinery is set on an elevated platform such platform shall be of substantial construction and standard guard rails and toeboards shall be provided along all open sides of the platform.

(17) Material hoists of more than one drum capacity shall be equipped with brake controls.

(18) A safety strap shall be provided on the foot block of all hoists.

(19) When electric motors are used for hoisting equipment, they shall be operated only by qualified personnel.

(a) Installations shall be made in accordance with provisions of local and national electrical safety codes, and shall be made by experienced workers only.

(b) Inclosed switches and fuses shall always be used.

(c) Switchboards shall be screened, and a sign placed warning unauthorized persons to keep clear.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-565, filed 7/20/94, effective 9/20/94; Order 74-26, § 296-155-565, filed 5/7/74, effective 6/6/74]

WAC 296-155-570 Rigging—Wire rope. (1) Whenever used in connection with work, employment, occupations or uses to which these standards are applicable, wire rope shall not be subjected to loads in excess of one-fifth the breaking load as given in the schedule of the cable manufacturer.

(2) Any wire rope showing 10% of its wires broken in a three foot length shall not be used. When cables deteriorate through rusting, wear, undue strain or other conditions to the extent of 15% of their original strength, use of cable shall be discontinued.

(3) Wire rope shall be frequently inspected for wear and other defects which may reduce the strength below the point of safe operation.

(4) If wire rope is received in a coil it shall be rolled out, on a surface free from grit, like a hoop and straightened out before being put on the sheaves. If it is received on a reel, the reel shall be mounted on a spindle or turntable and the rope then unwound.

(5) Wire rope shall be lubricated. A lubricant recommended by a wire rope manufacturer shall be used.

(6) Wire rope shall be securely fastened to drums by zinc plugs or suitable clamps, and at least two full turns of the rope shall remain on the winding drum.

(7) Wire rope shall be wound evenly on the drum and not allowed to lap one layer on another in an irregular fashion.

(8) Care shall be taken to prevent friction of wire ropes with other objects which could cause chafing or breaking of wires.

(9) In attaching U-type cable clamps, the U shall always be placed over the short end of the cable.

(1999 Ed.)

(10) The clamp nuts shall be tightened up frequently during the operation to prevent slipping.

(11) Thimbles shall be used in cable eyes whenever practicable.

(12) Fair leads shall be used ahead of cable drums, whenever practicable, and the fleet angle kept as flat as possible to promote proper spooling.

(13) All running lines of hoisting equipment, located within seven (7) feet of the ground or working level shall be boxed, railed off or otherwise guarded, or the operating area restricted.

(14) Wire rope which has been welded or been subject to welding of any kind shall not be used.

(15) No open hook shall be used to hoist a bucket, cage, spreader, or skip, nor in any circumstances where the dislodgement of the hook could cause a risk of injury to workers. A safety-hook, mousing, or shackle shall be employed in such circumstances.

(16) When shackles are used, shackle pins shall be secured to prevent accidental withdrawal.

(17) Where a wedge socket connector is used as a wire rope terminal, a single wire rope clip shall be installed in accordance with WAC 296-155-330 (3)(g).

(18) The wire rope shall not be burned off with heat. This may weld the ends of the wires and strands together.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-570, filed 1/21/86; Order 74-26, § 296-155-570, filed 5/7/74, effective 6/6/74.]

WAC 296-155-575 Helicopters and helicopter cranes.

(1) Helicopter regulations. Helicopter cranes shall be expected to comply with any applicable regulations of the Federal Aviation Administration.

(2) Briefing. Prior to each day's operation a briefing shall be conducted. This briefing shall set forth the plan of operation for the pilot and ground personnel.

(3) Slings and tag lines. Load shall be properly slung. Tag lines shall be of a length that will not permit their being drawn up into rotors. Pressed sleeve, swedged eyes, or equivalent means shall be used for all freely suspended loads to prevent hand splices from spinning open or cable clamps from loosening.

(4) Cargo hooks. All electrically operated cargo hooks shall have the electrical activating device so designed and installed as to prevent inadvertent operation. In addition, these cargo hooks shall be equipped with an emergency mechanical control for releasing the load. The hooks shall be tested prior to each day's operation to determine that the release functions properly, both electrically and mechanically.

(5) Personal protective equipment.

(a) Personal protective equipment for employees receiving the load shall consist of complete eye protection and hard hats secured by chinstraps.

(b) Loose-fitting clothing likely to flap in the downwash, and thus be snagged on hoist line, shall not be worn.

(6) Loose gear and objects. Every practical precaution shall be taken to provide for the protection of the employees from flying objects in the rotor downwash. All loose gear within 100 feet of the place of lifting the load, depositing the

load, and all other areas susceptible to rotor downwash shall be secured or removed.

(7) Housekeeping. Good housekeeping shall be maintained in all helicopter loading and unloading areas.

(8) Operator responsibility. The helicopter operator shall be responsible for size, weight, and manner in which loads are connected to the helicopter. If, for any reason, the helicopter operator believes the lift cannot be made safely, the lift shall not be made.

(9) Hooking and unhooking loads. Employees shall not perform work under hovering craft except for that limited period of time necessary to guide, secure and unhook loads, or to hook loads. Regardless of whether the hooking or unhooking of a load takes place on the ground or a flat roof, or other location in an elevated work position in structural members, a safe means of access and egress, to include an unprogrammed emergency escape route or routes, shall be provided for the employees who are hooking or unhooking loads.

(10) Static charge. Static charge on the suspended load shall be dissipated with a grounding device before ground personnel touch the suspended load, or protective rubber gloves shall be worn by all ground personnel touching the suspended load.

(11) Weight limitation. The weight of an external load shall not exceed the manufacturer's rating.

(12) Ground lines. Hoist wires or other gear, except for pulling lines or conductors that are allowed to "pay out" from a container or roll off a reel, shall not be attached to any fixed ground structure, or allowed to foul on any fixed structure.

(13) Visibility. When visibility is reduced by dust or other conditions, ground personnel shall exercise special caution to keep clear of main and stabilizing rotors. Precautions shall also be taken by the employer to eliminate as far as practical reduced visibility.

(14) Signal systems. Signal systems between aircrew and ground personnel shall be understood and checked in advance of hoisting the load. This applies to either radio or hand signal systems. Hand signals shall be as shown in Figure L-1.

(15) Approach distance. No unauthorized person shall be allowed to approach within 50 feet of the helicopter when the rotor blades are turning.

(16) Approaching helicopter. Whenever approaching or leaving a helicopter with blades rotating, all employees shall remain in full view of the pilot and keep in a crouched position. Employees shall avoid the area from the cockpit or cabin rearward unless authorized by the helicopter operator to work there.

(17) Personnel. Sufficient ground personnel shall be provided when required for safe helicopter loading and unloading operations.

(18) Communications. There shall be constant reliable communication between the pilot, and a designated employee of the ground crew who acts as a signalperson during the period of loading and unloading. This signalperson shall be distinctly recognizable from other ground personnel.

(19) Fires. Open fires shall not be permitted in an area that could result in such fires being spread by the rotor downwash.

WAC 296-155-576 Figure L-1.

(20) Refueling operations.

(a) Under no circumstances shall the refueling of any type helicopter with either aviation gasoline or Jet B (turbine-kerosene) type fuel be permitted while the engines are running.

(b) No unauthorized persons shall be allowed within fifty feet of the refueling operation or fueling equipment.

(c) A minimum of one thirty-pound fire extinguisher, or a combination of same, good for Class A, B and C fires, shall be provided within one hundred feet on the upwind side of the refueling operation.

(d) All fueling personnel shall be thoroughly trained in the refueling operation and in the use of available fire extinguishing equipment.

(e) There shall be no smoking, open flames, exposed flame heaters, flare pots or open flame lights for spark producing agents within fifty feet of the refueling area or fueling equipment. All entrances to the refueling area shall be posted with "NO SMOKING" signs.

(f) Due to the numerous causes of static electricity, it should be considered present at all times. Prior to starting refueling operations, the fueling equipment and the helicopter shall be grounded and the fueling nozzle shall be electrically bonded to the helicopter.

(i) Conductive hose shall not be used to accomplish the bonding.

(ii) All grounding and bonding connections shall be electrically and mechanically firm, to clean unpainted metal parts.

(g) To control spills:

(i) Fuel shall be pumped either by hand or power.

(ii) Pouring or gravity flow shall not be permitted.

(iii) Selfclosing nozzles shall not be dragged on the ground.

(h) In case of a spill, the fueling operation shall be immediately stopped until such time as the person in charge determines that it is safe to resume the refueling operation.

(i) When ambient temperatures have been in the one hundred degree F range for an extended period of time, all refueling of helicopters with the engines running shall be suspended until such time as conditions become suitable to resume refueling with the engines running.

(21) Hook on persons shall wear contrasting colored hard hats, with chinstraps, and high visibility vests or outer garments to enable the helicopter operator to readily identify their locations.

(22) Riding the load or hook of a helicopter is prohibited except in the case of emergency and then only with the proper safety gear.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-575, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-575, filed 1/21/86; Order 76-28, § 296-155-575, filed 9/28/76; Order 74-26, § 296-155-575, filed 5/7/74, effective 6/6/74.]

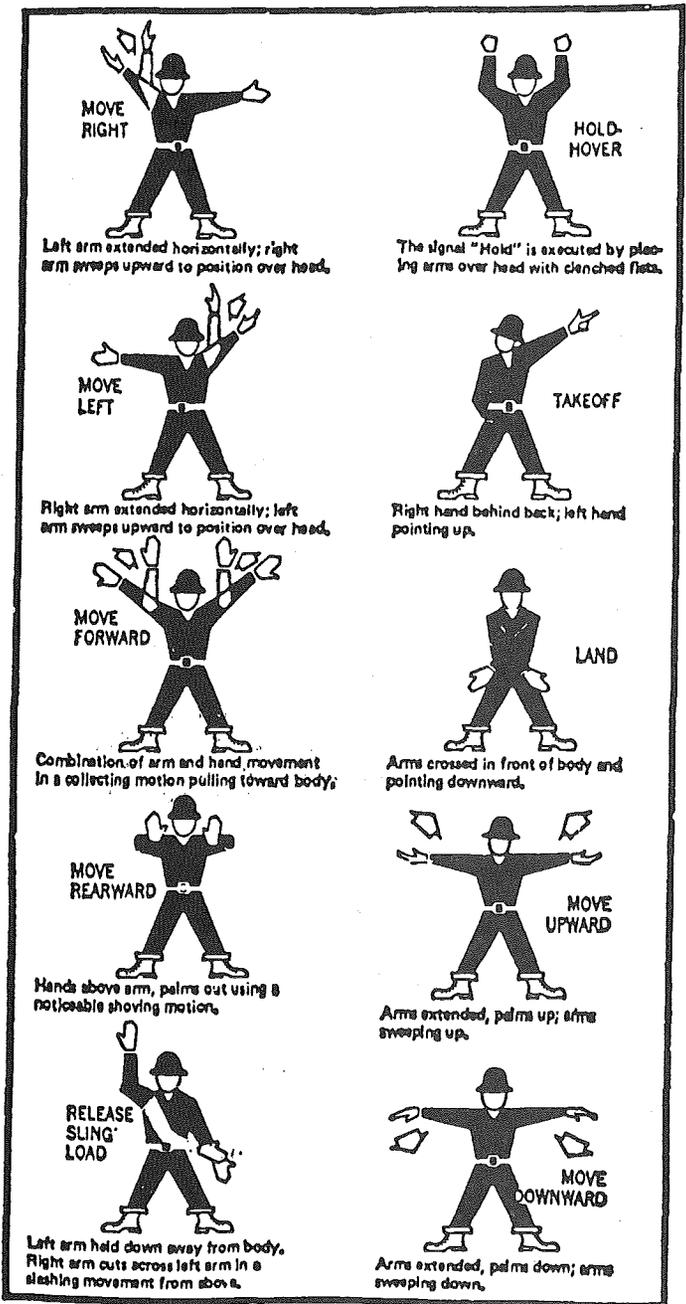


Figure L-1

HELICOPTER HAND SIGNALS

[Order 74-26, Figure L-1 (codified as WAC 296-155-576), filed 5/7/74, effective 6/6/74. Formerly WAC 296-155-575 (part).]

WAC 296-155-59901 Table 1.

TABLE 1

STANDARD 6 x 7 WIRE ROPE¹

Diameter	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds		
		Improved Plow Steel	Plow Steel	Mild Plow Steel
Inches	Pounds			
1/4	0.094	2.64	2.30	3.10
5/16	.15	4.10	3.56	3.10
3/8	.21	5.86	5.10	4.43
7/16	.29	7.93	6.90	6.00
1/2	.38	10.3	8.96	7.79
9/16	.48	13.0	11.3	9.82
5/8	.59	15.9	13.9	12.0
3/4	.84	22.7	19.8	17.2
7/8	1.15	30.7	26.7	23.2
1	1.50	39.7	34.5	30.0
1-1/8	1.90	49.8	43.3	37.7
1-1/4	2.34	61.0	53.0	46.1
1-3/8	2.84	73.1	63.6	55.3
1-1/2	3.38	86.2	75.0	65.2

¹ For these ropes with steel centers, add 7 1/2% to the above strengths. For these ropes when galvanized, deduct 10% from the above strengths.

[Order 74-26, § 296-155-580 (part), Table 1 (codified as WAC 296-155-59901), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59902 Table 2.

TABLE 2

STANDARD 6 x 19 WIRE ROPE¹

Diameter	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds		
		Improved Plow Steel	Plow Steel	Mild Plow Steel
Inches	Pounds			
1/4	0.10	2.74	2.39	2.07
5/16	.16	4.26	3.71	3.22
3/8	.23	6.10	5.31	4.62
7/16	.31	8.27	7.19	6.25
1/2	.40	10.7	9.35	8.13
9/16	.51	13.5	11.8	10.2
5/8	.63	16.7	14.5	12.6
3/4	.90	23.8	20.7	18.0
7/8	1.23	32.2	28.0	24.3
1	1.60	41.8	36.4	31.6
1- 1/8	2.03	52.6	45.7	39.8
1- 1/4	2.50	64.6	56.2	48.8
1- 3/8	3.03	77.7	67.5	58.8
1- 1/2	3.60	92.0	80.0	69.6
1- 5/8	4.23	107.0	93.4	81.2
1- 3/4	4.90	124.0	108.0	93.6
1- 7/8	5.63	141.0	123.0	107.0
2	6.40	160.0	139.0	121.0
2- 1/8	7.23	179.0	156.0	...
2- 1/4	8.10	200.0	174.0	...
2- 1/2	10.0	244.0	212.0	...
2- 3/4	12.10	292.0	254.0	...

¹ For these ropes with steel centers, add 7 1/2% to the above strengths. For these ropes when galvanized, deduct 10% from the above strengths.

(1999 Ed.)

[Order 74-26, § 296-155-580 (part), Table 2 (codified as WAC 296-155-59902), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59903 Table 3.

TABLE 3

STANDARD 8 x 19 WIRE ROPE¹

Diameter	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
Inches	Pounds		
1/4	0.09	2.35	2.04
5/16	.14	3.65	3.18
3/8	.20	5.24	4.55
7/16	.28	7.09	6.17
1/2	.36	9.23	8.02
9/16	.46	11.6	10.1
5/8	.57	14.3	12.4
3/4	.82	20.5	17.8
7/8	1.11	27.7	24.1
1	1.45	36.0	31.3
1- 1/8	1.84	45.3	39.4
1- 1/4	2.27	55.7	48.4
1- 3/8	2.74	67.1	58.3
1- 1/2	3.26	79.4	69.1

¹ For these ropes with steel centers, add 7 1/2% to the above strengths. For these ropes when galvanized, deduct 10% from the above strengths.

[Order 74-26, § 296-155-580 (part), Table 3 (codified as WAC 296-155-59903), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59904 Table 4.

TABLE 4

STANDARD 6 x 37 WIRE ROPE¹

Diameter	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
Inches	Pounds		
1/4	0.10	2.59	2.25
5/16	.16	4.03	3.50
3/8	.22	5.77	5.02
7/16	.30	7.82	6.80
1/2	.39	10.2	8.85
9/16	.49	12.9	11.2
5/8	.61	15.8	13.7
3/4	.87	22.6	19.6
7/8	1.19	30.6	26.6
1	1.55	39.8	34.6
1- 1/8	1.96	50.1	43.5
1- 1/4	2.42	61.5	53.5
1- 3/8	2.93	74.1	64.5
1- 1/2	3.49	87.9	76.4
1- 5/8	4.09	103.0	89.3
1- 3/4	4.75	119.0	103.0
1- 7/8	5.45	136.0	118.0
2	6.20	154.0	134.0
2- 1/8	7.00	173.0	150.0
2- 1/4	7.85	193.0	168.0
2- 1/2	9.69	236.0	205.0
2- 3/4	11.72	284.0	247.0
3	13.95	335.0	291.0
3- 1/4	16.37	390.0	339.0
3- 1/2	19.40	449.0	390.0

[Title 296 WAC—p. 2293]

¹ For these ropes with steel centers, add 7 1/2% to the above strengths.
For these ropes when galvanized, deduct 10% from the above strengths.

[Statutory Authority: Chapter 49.17 RCW, 91-24-017 (Order 91-07), § 296-155-59904, filed 11/22/91, effective 12/24/91; Order 74-26, § 296-155-580 (part), Table 4 (codified as WAC 296-155-59904), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59905 Table 5.

TABLE 5

STANDARD 6 x 19 ELEVATOR ROPE

DIAMETER	Approximate Weight Per Foot	BREAKING STRENGTH		
		Iron	Traction Steel	High-Rise
				Traction Steel
Pounds	Pounds	Pounds	Pounds	
Inches				
3/16	0.06	1,300	...	...
1/4	.10	2,200	3,600	...
5/16	.16	3,200	5,600	...
3/8	.23	5,000	8,200	...
7/16	.31	6,400	11,000	...
1/2	.40	8,400	14,500	...
9/16	.51	10,600	18,500	...
5/8	.63	12,800	23,000	...
11/16	.76	...	27,000	30,000
3/4	.90	18,200	32,000	...
13/16	1.06	...	37,000	46,000
7/8	1.23	24,800	42,000	...
15/16	1.41	...	48,000	60,000
1	1.60	32,000	54,000	...
1 - 1/16	1.81	...	61,000	...

[Order 74-26, § 296-155-580 (part), Table 5 (codified as WAC 296-155-59905), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59906 Table 6.

TABLE 6

STANDARD 8 x 19 ELEVATOR ROPE

DIAMETER	Approximate Weight Per Foot	BREAKING STRENGTH		
		Iron	Traction Steel	High-Rise
				Traction Steel
Pounds	Pounds	Pounds	Pounds	
Inches				
3/16	0.05	1,000	...	...
1/4	.09	1,800	3,600	...
5/16	.14	2,900	5,600	...
3/8	.20	4,200	8,200	...
7/16	.28	5,600	11,000	...
1/2	.36	7,200	14,500	...
9/16	.46	9,200	18,500	...
5/8	.57	11,200	23,000	...
11/16	.69	...	27,000	30,000
3/4	.82	16,000	32,000	...
13/16	.96	...	37,000	46,000
7/8	1.11	21,400	42,000	...
15/16	1.27	...	48,000	60,000
1	1.45	28,000	54,000	...
1 - 1/16	1.64	...	61,000	...

[Order 74-26, § 296-155-580 (part), Table 6 (codified as WAC 296-155-59906), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59907 Table 7.

TABLE 7

STANDARD 5 x 19 MARLINE CLAD ROPE¹

DIAMETER		Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
Before Serving	After Serving		Plow Steel	Mild Plow Steel
Inches	Inches	Pounds		
1/4	9/16	0.21	2.17	1.89
5/16	5/8	.28	3.37	2.93
3/8	11/16	.36	4.82	4.20
7/16	3/4	.42	6.53	5.68
1/2	13/16	.51	8.50	7.39
9/16	7/8	.62	10.7	9.31
5/8	1	.81	13.2	11.4
3/4	1 - 1/8	1.10	18.8	16.4
7/8	1 - 1/4	1.70	25.5	22.1
1	1 - 3/8	1.32	33.7	28.7
1 - 1/8	1 - 1/2	2.12	41.6	36.2
1 - 1/4	1 - 5/8	2.58	51.1	44.4
1 - 3/8	1 - 3/4	3.14	61.4	53.4
1 - 1/2	1 - 7/8	3.69	...	...
1 - 5/8	2	4.29	...	...
1 - 3/4	2 - 1/8	5.00	...	...

¹ For these ropes with steel centers, add 7 1/2% to the above strengths.
For these ropes when galvanized, deduct 10% from the above strengths.

[Order 74-26, § 296-155-580 (part), Table 7 (codified as WAC 296-155-59907), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59908 Table 8.

TABLE 8

STANDARD 18 x 7 NONROTATING ROPE

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
Inches	Pounds		
3/8	0.24	5.59	4.86
7/16	.33	7.58	6.59
1/2	.43	9.85	8.57
9/16	.55	12.4	10.8
5/8	.68	15.3	13.3
3/4	.97	21.8	19.0
7/8	1.32	29.5	25.7
1	1.73	38.3	33.3
1-1/8	2.19	48.2	41.9
1-1/4	2.70	59.2	51.5
1-3/8	3.27	71.3	62.0
1-1/2	3.89	84.4	73.4
1-5/8	4.57	98.4	85.6
1-3/4	5.30	114.0	98.8

[Order 74-26, § 296-155-580 (part), Table 8 (codified as WAC 296-155-59908), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59909 Table 9.

TABLE 9

STANDARD 6 x 12 GALVANIZED RUNNING ROPE AND HAWSERS

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds		
		Galvanized Improved Plow Steel	Galvanized Plow Steel	Galvanized Iron
Inches	Pounds			
5/16	0.10	2.34	2.04	0.905
3/8	.15	3.36	2.92	1.30
7/16	.20	4.55	3.95	1.76
1/2	.26	5.91	5.14	2.28
9/16	.33	7.45	6.48	2.88
5/8	.41	9.16	7.97	3.54
3/4	.59	13.1	11.4	5.06
13/16	.69	15.3	13.3	5.92
7/8	.80	17.7	15.4	6.85
1	1.05	23.0	20.0	8.89
1- 1/16	1.19	25.9	22.5	10.0
1- 1/8	1.33	29.0	25.2	...
1- 3/16	1.48	32.2	28.0	...
1- 1/4	1.64	35.6	30.9	...
1- 3/8	1.99	42.8	37.2	...
1- 7/16	2.17	46.7	40.6	...
1- 1/2	2.36	50.7	44.1	...
1- 5/8	2.77	59.2	51.4	...
1- 11/16	2.99	63.6	55.3	...
1- 3/4	3.22	68.3	59.4	...
1- 15/16	3.45	78.0	63.5	...
1- 15/16	3.94	83.0	72.2	...
2	4.20	88.2	76.7	...
2- 1/16	4.47	93.6	81.4	...

[Order 74-26, § 296-155-580 (part), Table 9 (codified as WAC 296-155-59909), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59910 Table 10.

TABLE 10

STANDARD 6 x 25 GALVANIZED STEEL MOORING LINES AND HAWSERS

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Galvanized Improved Plow Steel	Galvanized Plow Steel
Inches	Pounds		
3/8	0.194	4.77	4.14
1/2	.35	8.40	7.30
5/8	.54	13.0	11.3
3/4	.78	18.6	16.2
13/16	.91	21.8	19.0
7/8	1.06	25.2	21.9
1	1.38	32.8	28.5
1- 1/16	1.56	36.9	32.1
1- 1/8	1.75	41.2	35.9
1- 3/16	1.95	45.9	39.9
1- 1/4	2.16	50.7	44.1
1- 3/8	2.61	61.0	53.0
1- 7/16	2.85	66.5	57.9
1- 1/2	3.11	72.3	62.9
1- 5/8	3.64	84.5	73.4
1- 11/16	3.93	90.9	79.0
1- 3/4	4.23	97.5	84.8
1- 13/16	4.53	104.0	90.8
1- 15/16	5.18	119.0	103.0
2	5.52	126.0	110.0

(1999 Ed.)

TABLE 10

STANDARD 6 x 25 GALVANIZED STEEL MOORING LINES AND HAWSERS

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Galvanized Improved Plow Steel	Galvanized Plow Steel
Inches	Pounds		
2- 1/16	5.87	134.0	116.0

[Order 74-26, § 296-155-580 (part), Table 10 (codified as WAC 296-155-59910), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59911 Table 11.

TABLE 11

STANDARD 6 x 37 GALVANIZED STEEL HAWSERS

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
Inches	Pounds		
3/4	0.87	21.0	18.2
13/16	1.02	24.5	21.3
7/8	1.19	28.4	24.7
1	1.55	36.9	32.1
1- 1/16	1.75	41.6	36.1
1- 1/8	1.96	46.5	40.4
1- 3/16	2.19	51.7	44.9
1- 1/4	2.42	57.1	49.7
1- 3/8	22.93	68.8	59.8
1- 7/16	3.20	75.0	65.3
1- 1/2	3.49	81.5	70.9
1- 5/8	4.09	95.3	82.9
1- 11/16	4.41	103.0	89.2
1- 3/4	4.75	110.0	95.7
1- 13/16	5.09	118.0	102.0
1- 15/16	5.82	134.0	117.0
2	6.20	143.0	124.0
2- 1/16	6.59	151.0	132.0
2- 1/8	7.00	160.0	139.0
2- 1/4	7.85	179.0	156.0
2- 5/16	8.29	189.0	164.0
2- 3/8	8.74	199.0	173.0

[Order 74-26, § 296-155-580 (part), Table 11 (codified as WAC 296-155-59911), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59912 Table 12.

TABLE 12

STANDARD 6 x 25 TYPE "B" FLATTENED STRAND WIRE ROPE¹

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
Inches	Pounds		
3/8	0.25	6.71	...
1/2	.45	11.8	8.94
9/16	.57	14.9	11.2
5/8	.70	18.3	13.9
3/4	1.01	26.2	19.8
7/8	1.39	35.4	26.8
1	1.80	46.0	34.8
1- 1/8	2.28	57.9	43.8

[Title 296 WAC—p. 2295]

TABLE 12

STANDARD 6 x 25 TYPE "B" FLATTENED STRAND WIRE ROPE¹

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
Inches	Pounds		
1 - 1/4	2.81	71.0	53.7
1 - 3/8	3.40	85.5	...
1 - 1/2	4.05	101.0	...
1 - 5/8	4.75	118.0	...
1 - 3/4	5.51	136.0	...
2	7.20	176.0	...
2 - 1/4	9.10	220.0	...
2 - 1/2	11.20	269.0	...
2 - 3/4	13.60	321.0	...

¹For these ropes when galvanized, deduct 10 percent from the above strengths.

[Order 74-26, § 296-155-580 (part), Table 12 (codified as WAC 296-155-59912), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59913 Table 13.

TABLE 13

STANDARD 6 x 30 TYPE "G" FLATTENED STRAND WIRE ROPE¹

DIAMETER	Approximate	Breaking Strength in Tons of 2,000 Pounds	
Inches	Pounds		
5/8	0.70	18.3	13.9
3/4	1.01	26.2	19.8
7/8	1.39	35.4	26.8
1	1.80	46.0	34.8
1 - 1/8	2.28	57.9	43.8
1 - 1/4	2.81	71.0	53.7
1 - 3/8	3.40	85.5	...
1 - 1/2	4.05	101.0	...
1 - 5/8	4.75	118.0	...
1 - 3/4	5.51	136.0	...
2	7.20	176.0	...
2 - 1/4	9.10	220.0	...
2 - 1/2	11.20	269.0	...
2 - 3/4	13.60	321.0	...

¹For these ropes with steel centers, add 7 1/2% to above strengths.

[Order 74-26, § 296-155-580 (part), Table 13 (codified as WAC 296-155-59913), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59914 Table 14.

TABLE 14

STANDARD 6 x 8 TYPE "D" FLATTENED STRAND WIRE ROPE

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
Inches	Pounds		
1/2	0.45	11.1	8.37
5/8	.70	17.1	12.9
3/4	1.01	24.4	18.5
7/8	1.39	33.0	24.9
1	1.80	42.7	32.3

[Title 296 WAC—p. 2296]

TABLE 14

STANDARD 6 x 8 TYPE "D" FLATTENED STRAND WIRE ROPE

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Improved Plow Steel	Plow Steel
Inches	Pounds		
1 - 1/8	2.28	53.5	40.5
1 - 1/4	2.81	65.5	49.5
1 - 3/8	3.40	78.6	59.4
1 - 1/2	4.05	92.7	70.1

[Order 74-26, § 296-155-580 (part), Table 14 (codified as WAC 296-155-59914), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59915 Table 15.

TABLE 15

STANDARD 6 x 6 x 7 TILLER ROPE¹

DIAMETER	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
		Plow Steel	Iron
Inches	Pounds		
1/4	0.07	1.31	0.584
5/16	.11	2.05	.908
3/8	.16	2.93	1.30
7/16	.21	3.98	1.77
1/2	.28	5.18	2.30
9/16	.35	6.53	2.90
5/8	.43	8.04	3.57

¹For these ropes with steel centers, add 7 1/2% to above strengths.

[Order 74-26, § 296-155-580 (part), Table 15 (codified as WAC 296-155-59915), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59916 Table 16.

TABLE 16

STANDARD 9 x 4 GALVANIZED MAST ARM ROPE

Diameter Inches	Approximate Weight Per Foot Pounds	Breaking Strength In Pounds
1/4	0.070	1,100
5/16	.107	1,530
3/8	.158	2,200

[Order 74-26, § 296-155-580 (part), Table 16 (codified as WAC 296-155-59916), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59917 Table 17.

TABLE 17

STANDARD FLAT ROPE

Width and Thickness	Number of Ropes	Approximate Weight Per Foot	Breaking Strength in Tons of 2,000 Pounds	
			Plow Steel	Mild Plow Steel
Inches		Pounds		
1/4 x 1-1/2	7	0.69	16.8	14.6
1/4 x 2	9	.88	21.7	18.8
1/4 x 2-1/2	11	1.15	26.5	23.0
1/4 x 3	13	1.34	31.3	27.2
5/16 x 1-1/2	5	.77	18.5	16.0
5/16 x 2	7	1.05	25.8	22.4
5/16 x 2-1/2	9	1.33	33.2	28.8
5/16 x 3	11	1.61	40.5	35.3
5/16 x 3-1/2	13	1.89	47.9	41.7
5/16 x 4	15	2.17	55.3	48.1
3/8 x 2	6	1.25	31.4	27.3
3/8 x 2-1/2	8	1.64	41.8	36.4
3/8 x 3	9	1.84	47.1	40.9
3/8 x 3-1/2	11	2.23	57.5	50.0
3/8 x 4	12	2.44	62.7	54.6
3/8 x 4-1/2	14	2.83	73.2	63.7
3/8 x 5	15	3.03	78.4	68.2
3/8 x 5-1/2	17	3.42	88.9	77.3
3/8 x 6	18	3.63	94.1	81.9
1/2 x 2-1/2	6	2.13	54.5	47.4
1/2 x 3	7	2.47	63.6	55.4
1/2 x 3-1/2	8	2.82	72.7	63.3
1/2 x 4	9	3.16	81.8	71.2
1/2 x 4-1/2	10	3.82	90.9	79.1
1/2 x 5	12	4.16	109.0	94.9
1/2 x 5-1/2	13	4.50	118.0	103.0
1/2 x 6	14	4.85	127.0	111.0
1/2 x 7	16	5.85	145.0	126.0
5/8 x 3-1/2	6	3.40	85.8	74.6
5/8 x 4	7	3.95	100.0	87.1
5/8 x 4-1/2	8	4.50	114.0	99.5
5/8 x 5	9	5.04	129.0	112.0
5/8 x 5-1/2	10	5.59	143.0	124.0
5/8 x 6	11	6.14	157.0	137.0
5/8 x 7	13	7.23	186.0	162.0
5/8 x 8	15	8.32	214.0	186.0
3/4 x 5	8	6.50	165.0	143.0
3/4 x 6	9	7.31	185.0	161.0
3/4 x 7	10	8.13	206.0	179.0
3/4 x 8	11	9.70	227.0	197.0
7/8 x 5	7	7.50	190.0	165.0
7/8 x 6	8	8.56	217.0	188.0
7/8 x 7	9	9.63	244.0	212.0
7/8 x 8	10	10.69	271.0	236.0

[Order 74-26, § 296-155-580 (part), Table 17 (codified as WAC 296-155-59917), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59918 Table 18.

TABLE 18

STANDARD 6 x 12 MARLINE CLAD GRAIN-SHOVEL ROPE

Before Serving Inches	After Serving Inches	Approximate Weight Per Foot Pounds	Breaking Strength Tons of 2,000 Pounds
3/4	5/8	0.25	2.50
7/8	3/4	.43	5.50

[Order 74-26, § 296-155-580 (part), Table 18 (codified as WAC 296-155-59918), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59919 Table 19.

TABLE 19

STANDARD 6 x 7 IRON, BRIGHT, AND GALVANIZED SASH CORDS

BREAKING STRENGTH

DIAMETER	Approximate Weight Per Foot	Hard Drawn		Annealed (iron)
		Bright	Galvanized	Bright or Galvanized
Inches	Pounds	Pounds	Pounds	Pounds
1/16	0.006	140	126	77
3/32	.103	315	283	172
1/8	.023	560	504	306
5/32	.038	840	756	478
3/16	.053	1,150	1,035	688
7/32	.072	1,570	1,413	940
1/4	.094	2,040	1,836	1,225

[Order 74-26, § 296-155-580 (part), Table 19 (codified as WAC 296-155-59919), filed 5/7/74, effective 6/6/74.]

WAC 296-155-59920 Table 20.

TABLE 20

STANDARD 6 x 7 GALVANIZED IRON RIGGING AND GUY ROPE

Diameter Inches	Approximate Weight Per Foot Pounds	Breaking Strength in Tons of 2,000 Pounds
6 Strands:		
1/4	0.94	0.918
5/16	.15	1.42
3/8	.21	2.04
7/16	.29	2.76
1/2	.38	3.58
9/16	.48	4.51
5/8	.59	5.54
3/4	.84	7.90
13/16	.99	9.23
7/8	1.15	10.7
1	1.50	13.8
1 1/16	1.70	15.5
1 1/8	1.90	17.3
1 3/16	2.12	19.2
1 1/4	2.34	21.2

[Order 74-26, § 296-155-580 (part), Table 20 (codified as WAC 296-155-59920), filed 5/7/74, effective 6/6/74.]

PART M
MOTOR VEHICLES, MECHANIZED EQUIPMENT,
AND MARINE OPERATIONS

WAC 296-155-600 Definitions applicable to this part.

- (1) "Apron" means the area along the waterfront edge of the pier or wharf.
- (2) "Bearing cap" means:
- (a) A slab of reinforced concrete or a heavy timber and plank platform covering the top of a group of piles for the purpose of tying them together and transmitting to them as a group the superimposed load.
- (b) A metal plate placed across the top of a steel tube pile to distribute the load from the steel tube to the concrete.
- (3) "Bearing pile" means a column of wood, metal or concrete or a combination of two or more of these materials, driven, jacked, or sunk with a water jet, into the earth to transmit and distribute loads to strata below the surface.
- (4) "Bulwark" means the side of a ship above the upper deck.
- (5) "Caisson pile" means a concrete pile case in an outer casing consisting of a series of telescoping steel tubes, the top section being the largest and usually twenty inches or more in diameter.
- (6) "Coaming" means the raised frame, as around a hatchway in the deck, to keep out water.
- (7) "Composite pile" means a pile which consists of a concrete pile superimposed on a wood pile.
- (8) "Jacob's ladder" means a marine ladder of rope or chain with wooden or metal rungs.
- (9)(a) A "pedestal type" concrete pile means a cast-in-place pile with an enlarged (mushroom) base or foot.
- (b) A "tapered type" concrete pile means a cast-in-place pile cast in a tapered metal shell.
- (10) "Precast concrete pile" means a pile which is cast in a form above ground.
- (11) "Driving cap" means a device placed on the top of a pile to prevent its breakage or injury during the driving operation.
- (12) "H-pile" means a pile formed of a structural steel column of "H" section.
- (13) "Pile driver" means a device or piece of equipment used in driving piles.
- (14) "Pretest or jack pile" means a steel cylinder pile driven in section beneath an existing building and filled with concrete.
- (15) "Rail," for the purpose of WAC 296-155-630, means a light structure serving as a guard at the outer edge of a ship's deck.
- (16) "Sheet piling" means a continuous vertical barricade consisting of squared timbers driven edge to edge, either square edged or tongued and grooved, or of a series of interlocking steel shapes, to form a temporary wall about an excavation, and shored and braced as necessary.
- (17) "Steel-tube" means a concrete-filled steel cylinder, consisting of an open or closed-end steel tube or cylinder.
- (18) "Wood pile" means a pile which is formed from the trunk of a tree or dimension timbers.

[Order 74-26, § 296-155-600, filed 5/7/74, effective 6/6/74.]

[Title 296 WAC—p. 2298]

WAC 296-155-605 Equipment. (1) General requirements.

(a) All equipment left unattended at night, adjacent to a highway in normal use, or adjacent to construction areas where work is in progress, shall have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, to identify the location of the equipment.

(b) All tire servicing of multipiece and single-piece rim wheels are subject to the requirements of WAC 296-155-61701 through 296-155-61713.

(c)(i) Heavy machinery, equipment, or parts thereof, which are suspended or held aloft by use of slings, hoists, or jacks shall be substantially blocked or cribbed to prevent falling or shifting before employees are permitted to work under or between them. Bulldozer and scraper blades, end-loader buckets, dump bodies, and similar equipment, shall be either fully lowered or blocked when being repaired or when not in use. All controls shall be in a neutral position, with the motors stopped and brakes set, unless work being performed required otherwise.

(ii) Whenever the equipment is parked, the parking brake shall be set. Equipment parked on inclines shall have the wheels chocked and the parking brake set.

(d) The use, care and charging of all batteries shall conform to the requirements of part I of this chapter.

(e) All cab glass shall be safety glass, or equivalent, that introduces no visible distortion affecting the safe operation of any machine covered by this part.

(f) All equipment covered by this part shall comply with the requirements of WAC 296-155-525 (3)(a) when working or being moved in the vicinity of power lines or energized transmitters.

(g) Where traffic is diverted onto dusty surfaces, good visibility shall be maintained by the suppression of dust, through the periodic application of oil or water to the grade surface, as required.

(h) No equipment, vehicle, tool, or individual shall operate within 10 feet of any power line or electrical distribution equipment except in conformity with the requirements of WAC 296-155-525 (3)(a).

(2) Specific requirements. (Reserved.)

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060, 98-05-046, § 296-155-605, filed 2/13/98, effective 4/15/98. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-605, filed 1/21/86; Order 74-26, § 296-155-605, filed 5/7/74, effective 6/6/74.]

WAC 296-155-610 Motor vehicles. (1) Coverage. Motor vehicles as covered by this part include any vehicles that operate on a construction site. The requirements of this section do not apply to equipment for which rules are prescribed in WAC 296-155-615.

(2) General requirements.

(a) All vehicles shall have a service brake system, an emergency brake system, and a parking brake system. These systems may use common components, and shall be maintained in operable condition.

(b) Before leaving a motor vehicle unattended:

(i) The motor shall be stopped.

(ii) Parking brake engaged and wheels turned into curb or berm when parked on an incline.

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(iii) When parking on an incline and there is no curb or berm, the wheels shall be chocked or otherwise secured.

(c)(i) Whenever visibility conditions warrant additional light, all vehicles, or combinations of vehicles, in use shall be equipped with at least two headlights and two taillights in operable condition.

(ii) All vehicles, or combination of vehicles, shall have brake lights in operable condition regardless of light conditions.

(d) All vehicles shall be equipped with an adequate audible warning device at the operator's station and in an operable condition.

(e) No employer shall allow the use of any motor vehicle equipment having an obstructed view to the rear unless:

(i) Vehicles other than passenger cars and pickups shall have an automatic reverse signal alarm audible above the surrounding noise level no less than fifteen feet from the rear of the vehicle or:

(ii) The vehicle is backed up only when an observer signals that it is safe to do so.

(f) All vehicles with cabs shall be equipped with windshields, powered wipers, and rear view mirrors. Cracked and broken glass shall be replaced. Vehicles operating in areas or under conditions that cause fogging or frosting of the windshields shall be equipped with operable defogging or defrosting devices.

(g) All haulage vehicles, whose pay load is loaded by means of cranes, power shovels, loaders, or similar equipment, shall have a cab shield and/or canopy adequate to protect the operator from shifting or falling materials.

(h) Tools and material shall be secured to prevent movement when transported in the same compartment with employees.

(i) Vehicles used to transport employees shall have seats firmly secured and adequate for the number of employees to be carried.

(j) Seat belts and anchorages meeting the requirements of 49 CFR Part 571 (Department of Transportation, Federal Motor Vehicle Safety Standards) shall be installed in all motor vehicles.

(k) Trucks with dump bodies or raiseable platforms, beds, or boxes shall be equipped with positive means of support, permanently attached, and capable of being locked in position to prevent accidental lowering of the body while maintenance or inspection work is being done.

(l) Operating levers, controlling hoisting or dumping devices on haulage bodies, shall be equipped with a latch or other device which will prevent accidental starting or tripping of the mechanism.

(m) Trip handles for tailgates of dump trucks shall be so arranged that, in dumping, the operator will be in the clear.

(n) All rubber-tired motor vehicle equipment manufactured on or after May 1, 1972, shall be equipped with fenders. All rubber-tired motor vehicle equipment manufactured before May 1, 1972, shall be equipped with fenders not later than October 1, 1974. Mud flaps may be used in lieu of fenders whenever motor vehicle equipment is not designed for fenders.

(o) All vehicles in use shall be checked at the beginning of each shift to assure that the following parts, equipment,

and accessories are in safe operating condition and free of apparent damage that could cause failure while in use: Service brakes, including trailer brake connections; parking system (hand brake); emergency stopping system (brakes); tires; horn; steering mechanism; coupling devices; seat belts; operating controls; and safety devices. All defects shall be corrected before the vehicle is placed in service. These requirements also apply to equipment such as lights, reflectors, windshield wipers, defrosters, fire extinguishers, steps and handholds for vehicle access, etc., where such equipment is necessary.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-610, filed 1/21/86; Order 74-26, § 296-155-610, filed 5/7/74, effective 6/6/74.]

WAC 296-155-615 Material handling equipment. (1) Earthmoving equipment; general.

(a) These rules apply to the following types of earthmoving equipment: Scrapers, loaders, crawler or wheel tractors, bulldozers, off-highway trucks, graders, agricultural and industrial tractors, and similar equipment. The promulgation of specific rules for compactors and rubber-tired "skid-steer" equipment is reserved pending consideration of standards currently being developed.

(b) Seat belts.

(i) Seat belts shall be provided on all equipment covered by this section and shall meet the requirements of the Society of Automotive Engineers, J386-1969, Seat Belts for Construction Equipment. Seat belts for agricultural and light industrial tractors shall meet the seat belt requirements of Society of Automotive Engineers J333a-1970, Operator Protection for Agricultural and Light Industrial Tractors.

(ii) Seat belts need not be provided for equipment which is designed only for standup operation.

(iii) Seat belts shall not be provided for equipment which does not have rollover protective structure (ROPS) or adequate canopy protection.

(c) Access roadways and grades.

(i) No employer shall move or cause to be moved construction equipment or vehicles upon any access roadway or grade unless the access roadway or grade is constructed and maintained to accommodate safely the movement of the equipment and vehicles involved.

(ii) Every emergency access ramp and berm used by an employer shall be constructed to restrain and control runaway vehicles.

(d) Brakes. All earthmoving equipment mentioned in WAC 296-155-615 (1)(a) shall have a service braking system capable of stopping and holding the equipment fully loaded, as specified in Society of Automotive Engineers SAE-J237, Loader Dozer-1971, J236, Graders-1971, and J319b, Scrapers-1971. Brake systems for self-propelled rubber-tired off-highway equipment manufactured after January 1, 1972 shall meet the applicable minimum performance criteria set forth in the following Society of Automotive Engineers Recommended Practices:

Self-propelled scrapers	_____	SAE J319b-1971
Self-propelled graders	_____	SAE J236-1971

Trucks and _____ wagons	SAE J166-1971
Front end loaders _____ and dozer	SAE J237-1971

(e) Fenders. Pneumatic-tired earthmoving haulage equipment (trucks, scrapers, tractors, and trailing units) whose maximum speed exceeds 15 miles per hour, shall be equipped with fenders on all wheels to meet the requirements of Society of Automotive Engineers SAE J321a- 1970, Fenders for Pneumatic-Tired Earthmoving Haulage Equipment. An employer may, of course, at any time seek to show under WAC 296-155-010, that the uncovered wheels present no hazard to personnel from flying materials.

(f) Rollover protective structures (ROPS). See Part V of this chapter for requirements for rollover protective structures and overhead protection.

(g) Rollover protective structures for off-highway trucks. The promulgation of standards for rollover protective structures for off-highway trucks is reserved pending further study and development.

(h) Specific effective dates—Brakes and fenders. Equipment mentioned in WAC 296-155-615 (d) and (e) and manufactured after January 1, 1972, which is used by any employer after that date, shall comply with the applicable rules prescribed therein concerning brakes. Equipment mentioned in WAC 296-155-615 (d) and (e) and manufactured before January 1, 1972, which is used by any employer after that date, shall meet the applicable rules prescribed herein not later than October 1, 1974. It should be noted that employers may request variations from the applicable brakes standards required by this part. Employers wishing to seek variations from the applicable brakes rules may submit any requests for variations in accordance with WAC 296-155-010. Any statements should specify how the variation would protect the safety of the employees by providing for any compensating restrictions on the operation of equipment.

(i) Audible alarms.

(i) All bidirectional machines, such as rollers, compactors, front-end loaders, bulldozers, and similar equipment, shall be equipped with a horn, distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction. The horn shall be maintained in an operative condition.

(ii) No employer shall permit earthmoving or compacting equipment which has an obstructed view to the rear to be used in reverse gear unless the equipment has in operation a reverse signal alarm distinguishable from the surrounding noise level or an employee signals that it is safe to do so.

(iii) In circumstances where the surrounding noise level is of such amplitude that reverse signal alarms are not effective, amber strobe lights shall be used.

(iv) Operators of equipment which does not have an obstructed view to the rear shall look to the rear while operating the equipment in reverse.

(j) Scissor points. Scissor points on all front-end loaders, which constitute a hazard to the operator during normal operation, shall be guarded.

(k) Tractor motors shall be cranked only by operators or other experienced persons.

(l) Waterproof and comfortable seat cushions shall be provided on tractors at all times when working.

(m) Riders, except mechanics and persons in training to operate equipment, shall not be allowed on equipment unless a seat with a seatbelt is provided and used.

(n) Winch lines shall be maintained in good condition and provided with spliced eye, knob or hook in working end, except under conditions where unspliced end is required.

(o) No repairs on blade or dozer equipment shall be initiated unless motor has been stopped and dozer blade is resting on the ground or securely blocked. The same shall apply to carry-all gates.

(p) Bulldozer blades and carryall gates shall rest on the ground or on blocking when machines are not in operation.

(q) Operator shall not leave controls of tractor with master clutch engaged.

(r) Personnel shall not get on or off machine while machine is in motion.

(s) Where excessive dust conditions are created, such areas shall be sprinkled with water to maintain dust at a minimum.

(t) Respirators shall be worn by operators when subject to harmful dust exposure.

(2) Excavating and other equipment.

(a) Tractors covered in subsection (1) of this section shall have seat belts as required for the operators when seated in the normal seating arrangement for tractor operation, even though backhoes, breakers, or other similar attachments are used on these machines for excavating or other work.

(b) For the purposes of this part and of Part L of this chapter, the nomenclatures and descriptions for measurement of dimensions of machinery and attachments shall be as described in Society of Automotive Engineers 1970 Handbook, pages 1088 through 1103.

(c) The safety requirements, ratios, or limitations applicable to machines or attachment usage covered in Power Crane and Shovel Association's Standards No. 1 and No. 2 of 1968, and No. 3 of 1969, shall be complied with, and shall apply to cranes, machines, and attachments under this part.

(3) Lifting and hauling equipment (other than equipment covered under Part L of this chapter). Industrial trucks (including forklifts) shall meet the requirements of WAC 296-155-605 and the following:

(a) Lift trucks, stackers, etc., shall have the rated capacity clearly posted on the vehicle so as to be clearly visible to the operator. When auxiliary removable counter-weights are provided by the manufacturer, corresponding alternate rated capacities also shall be clearly shown on the vehicle. These ratings shall not be exceeded.

(b) No modifications or additions which affect the capacity or safe operation of the equipment shall be made without the manufacturer's or professional engineer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

(c) If a load is lifted by two or more trucks working in unison, the proportion of the total load carried by any one truck shall not exceed its capacity.

(d) Steering or spinner knobs shall not be attached to the steering wheel unless the steering mechanism is of a type that prevents road reactions from causing the steering handwheel to spin. The steering knob shall be mounted within the periphery of the wheel.

(e) All high lift rider industrial trucks shall be equipped with overhead guards which meet the configuration and structural requirements as defined in paragraph 502 of American National Standards Institute B56.1-1975, Safety Standards for Powered Industrial Trucks.

(f) All industrial trucks in use shall meet the applicable requirements of design, construction, stability, inspection, testing, maintenance, and operation, as defined in American National Standards Institute B56.1-1975, Safety Standards for Powered Industrial Trucks.

(g) Unauthorized personnel shall not be permitted to ride on powered industrial trucks. A safe place to ride shall be provided where riding of trucks is authorized.

(h) When a forklift truck is used for elevating workers a platform shall be specifically built for that purpose and shall comply with the following requirements:

(i) The platform shall be securely attached to the forks and shall have standard guardrails and toeboards on all open sides.

(ii) The hydraulic system of the forklift shall be so designed that the lift mechanism will not drop faster than one hundred thirty-five feet per minute in the event of a failure in any part of the system. Forklifts used for elevating platforms shall be identified that they are so designed.

(iii) A safety strap shall be installed or the control lever shall be locked to prevent the boom from tilting.

(iv) An operator shall be at the controls of the forklift equipment while persons are on the platform.

(v) The operator shall be in the normal operating position while raising or lowering the platform.

(vi) The vehicle shall not travel from point to point while workers are on the platform except that inching or maneuvering at very slow speed is permissible.

(vii) The area between workers on the platform and the mast shall be adequately guarded to prevent contact with chains or other shear points.

(viii) All platforms shall be visually inspected daily or before each use by the person in charge of the work being performed, and shall be tested as frequently as is necessary to maintain minimum safety factors.

(ix) Whenever a truck, except for high lift order picker trucks, is equipped with vertical hoisting controls elevatable with the lifting carriage or forks, the following precautions shall be taken for the protection of personnel being elevated.

(A) Provide a platform secured to the lifting carriage and/or forks.

(B) Provide means whereby personnel on the platform can shut off power to the truck.

(C) Provide such protection from falling objects as indicated necessary by the operating conditions.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-615, filed 2/13/98, effective 4/15/98. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-615, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-615, filed 1/21/86; Order 74-26, § 296-155-615, filed 5/7/74, effective 6/6/74.]

(1999 Ed.)

WAC 296-155-617 Servicing multipiece and single-piece rim wheels.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-617, filed 1/21/86.]

WAC 296-155-61701 Scope. (1) Application. This section applies to the servicing of multipiece and single-piece rim wheels used on large vehicles such as trucks, tractors, trailers, buses and off-road machines. It does not apply to the servicing of rim wheels used on automobiles, or on pickup trucks and vans utilizing automobile tires or truck tires designated "LT."

(2) All provisions of this section apply to the servicing of both single-piece rim wheels and multipiece rim wheels unless designated otherwise.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61701, filed 1/21/86.]

WAC 296-155-61703 Definitions. (1) "Barrier" means a fence, wall or other structure or object placed between a single-piece rim wheel and an employee during tire inflation, to contain the rim wheel components in the event of the sudden release of the contained air of the single-piece rim wheel.

(2) "Charts" means the United States Department of Transportation, National Highway Traffic Safety Administration (NHTSA) publications entitled *Safety Precautions for Mounting and Demounting Tube-Type Truck/Bus Tires* and *Multipiece Rim Wheel Matching Chart*, or any other publications such as rim manuals containing, at a minimum, the same instructions, safety precautions and other information contained on those charts that are applicable to the types of rim wheels being serviced.

(3) "Installing a rim wheel" means the transfer and attachment of an assembled rim wheel onto a vehicle axle hub. "Removing" means the opposite of installing.

(4) "Mounting a tire" means the assembly or putting together of the wheel and tire components to form a rim wheel, including inflation. "Demounting" means the opposite of mounting.

(5) "Multipiece rim wheel" means the assemblage of a multipiece wheel with the tire tube and other components.

(6) "Multipiece wheel" means a vehicle wheel consisting of two or more parts, one of which is a side or locking ring designed to hold the tire on the wheel by interlocking components when the tire is inflated.

(7) "Restraining device" means an apparatus such as a cage, rack, assemblage of bars and other components that will constrain all rim wheel components during an explosive separation of a multipiece rim wheel, or during the sudden release of the contained air of a single-piece rim wheel.

(8) "Rim manual" means a publication containing instructions from the manufacturer or other qualified organization for correct mounting, demounting, maintenance, and safety precautions peculiar to the type of wheel being serviced.

(9) "Rim wheel" means an assemblage of tire, tube and liner (where appropriate), and wheel components.

(10) "Service" or "servicing" means the mounting and demounting of rim wheels, and related activities such as inflating, deflating, installing, removing, and handling.

[Title 296 WAC—p. 2301]

(11) "Service area" means that part of an employer's premises used for the servicing of rim wheels, or any other place where an employee services rim wheels.

(12) "Single-piece rim wheel" means the assemblage of single-piece rim wheel with the tire and other components.

(13) "Single-piece wheel" means a vehicle wheel consisting of one part, designed to hold the tire on the wheel when the tire is inflated.

(14) "Trajectory" means any potential path or route that a rim wheel component may travel during an explosive separation, or the sudden release of the pressurized air, or an area at which an airblast from a single-piece rim wheel may be released. The trajectory may deviate from paths which are perpendicular to the assembled position of the rim wheel at the time of separation or explosion. (See Appendix A for examples of trajectories.)

(15) "Wheel" means that portion of a rim wheel which provides the method of attachment of the assembly to the axle of a vehicle and also provides the means to contain the inflated portion of the assembly (i.e., the tire and/or tube).

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61703, filed 1/21/86.]

WAC 296-155-61705 Employee training. (1) Employer responsibility. The employer shall provide a program to train all employees who service rim wheels in the hazards involved in servicing those multipiece rim wheels and the safety procedures to be followed.

(a) The employer shall assure that no employee services any rim wheel unless the employee has been trained and instructed in correct procedures of servicing the type of wheel being serviced, and in the safe operating procedures described in WAC 296-24-21711.

(b) Information to be used in the training program shall include, at a minimum, the applicable data contained in the charts (rim manuals) and the contents of this standard.

(c) Where an employer knows or has reason to believe that any of the employees are unable to read and understand the charts or rim manual, the employer shall assure that the employee is instructed concerning the contents of the charts and rim manual in a manner which the employee is able to understand.

(2) Employee qualification. The employer shall assure that each employee demonstrates and maintains the ability to service rim wheels safely, including performance of the following tasks:

(a) Demounting of tires (including deflation);

(b) Inspection and identification of the rim wheel components;

(c) Mounting of tires (including inflation with a restraining device or other safeguard required by this section);

(d) Use of the restraining device or barrier, and other equipment required by this section;

(e) Handling of rim wheels;

(f) Inflation of the tire when a single-piece rim wheel is mounted on a vehicle;

(g) An understanding of the necessity of standing outside the trajectory both during inflation of the tire and during inspection of the rim wheel following inflation; and

(h) Installation and removal of wheels.

(3) Ongoing training. The employer shall evaluate each employee's ability to perform these tasks and to service rim wheels safely and shall provide additional training as necessary to assure that each employee maintains his or her proficiency.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-61705, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61705, filed 1/21/86.]

WAC 296-155-61707 Tire servicing equipment. (1) Restraining device - Multipiece. The employer shall furnish a restraining device for inflating tires on multipiece wheels.

(2) Restraining device - Single-piece. The employer shall provide a restraining device or barrier for inflating tires on single-piece wheels unless the rim wheel will be bolted onto a vehicle during inflation.

(3) Restraining device requirements. Restraining devices and barriers shall comply with the following requirements:

(a) Each restraining device or barrier shall have the capacity to withstand the maximum force that would be transferred to it during a rim wheel separation occurring at one hundred fifty percent of maximum tire specification pressure for the type of rim wheel being serviced;

(b) Restraining devices and barriers shall be capable of preventing rim components from being thrown outside or beyond the device or barrier for any rim wheel position within or behind the device;

(c) Restraining devices and barriers shall be visually inspected prior to each day's use and after any separation of the rim wheel components or sudden release of contained air. Any restraining device or barrier exhibiting damage such as the following defects shall be immediately removed from service:

(i) Cracks at welds;

(ii) Cracked or broken components;

(iii) Bent or sprung components caused by mishandling, abuse, tire explosion or rim wheel separation;

(iv) Pitting of components due to excessive corrosion; or

(v) Other structural damage which would decrease its effectiveness.

(d) Restraining devices removed from service shall not be returned to service until they are repaired and reinspected. Restraining devices or barriers requiring structural repair such as component replacement or rewelding shall not be returned to service until they are certified either by the manufacturer or by a registered professional engineer as meeting the strength requirements of subsection (3)(a) of this section.

(4) Air line assembly. The employer shall furnish and assure that an air line assembly consisting of the following components be used for inflating tires:

(a) A clip-on chuck;

(b) An in-line valve with a pressure gauge or a presettable regulator; and

(c) A sufficient length of hose between the clip-on chuck and the in-line valve (if one is used) to allow the employee to stand outside the trajectory.

(5) Rim manuals. Current charts (rim manuals) containing instructions for the types of wheels being serviced shall be available in the service area.

(6) Rim manual availability. A current rim manual containing instructions for the type of rims being serviced shall be available in the service area.

(7) Recommended servicing tools. The employer shall furnish and assure that only tools recommended in the rim manual for the type of wheel being serviced are used to service rim wheels.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61707, filed 1/21/86.]

WAC 296-155-61709 Wheel component acceptability.

(1) Interchange of components. Multipiece wheel components shall not be interchanged except as provided in the charts, or in the applicable rim manual.

(2) Inspection of components. Multipiece wheel components and single-piece wheels shall be inspected prior to assembly. Any wheel or wheel component which is bent out of shape, pitted from corrosion, broken or cracked shall not be used and shall be marked or tagged unserviceable and removed from the service area. Damaged or leaky valves shall be replaced.

(3) Condition of components. Rim flanges, rim gutters, rings, bead seating surfaces and the bead areas of tires shall be free of any dirt, surface rust, scale or loose or flaked rubber build-up prior to mounting and inflation.

(4) Compatibility check. The size (bead diameter and tire/wheel widths) and type of both the tire and the wheel shall be checked for compatibility prior to assembly of the rim wheel.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61709, filed 1/21/86.]

WAC 296-155-61711 Safe operating procedure—Multipiece rim wheels. The employer shall establish a safe operating procedure for servicing multipiece rim wheels and shall assure that employees are instructed in and follow that procedure. The procedure shall include at least the following elements:

(1) Deflation before demounting. Tires shall be completely deflated before demounting by removal of the valve core.

(2) Deflation on axle. Tires shall be completely deflated by removing the valve core, before a rim wheel is removed from the axle in either of the following situations:

(a) When the tire has been driven underinflated at eighty percent or less of its recommended pressure; or

(b) When there is obvious or suspected damage to the tire or wheel components.

(3) Rubber lubricant. Rubber lubricant shall be applied to bead and rim mating surfaces during assembly of the wheel and inflation of the tire, unless the tire or wheel manufacturer recommends against it.

(4) Inflation of tire while on vehicle. If a tire on a vehicle is underinflated but has more than eighty percent of the recommended pressure, the tire may be inflated while the rim wheel is on the vehicle provided remote control inflation equipment is used, and no employees remain in the trajectory during inflation.

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(5) Tire bead. Tires shall be inflated outside a restraining device only to a pressure sufficient to force the tire bead onto the rim ledge and create an airtight seal with the tire and bead.

(6) Restraining device clearance. Whenever a rim wheel is in a restraining device the employee shall not rest or lean any part of the body or equipment on or against the restraining device.

(7) Inspection of components. After tire inflation, the tire and wheel components shall be inspected while still within the restraining device to make sure that they are properly seated and locked. If further adjustment to the tire or wheel components is necessary, the tire shall be deflated by removal of the valve core before the adjustment is made.

(8) Use of force. No attempt shall be made to correct the seating of side and lock rings by hammering, striking or forcing the components while the tire is pressurized.

(9) Damaged components. Cracked, broken, bent, or otherwise damaged rim components shall not be reworked, welded, brazed, or otherwise heated.

(10) Trajectory clearance. Whenever multipiece rim wheels are being handled, employees shall stay out of the trajectory unless the employer can demonstrate that performance of the servicing makes the employee's presence in the trajectory necessary.

(11) Wheel heating prohibition. No heat shall be applied to a multipiece wheel or wheel component.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-61711, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-61711, filed 1/21/86.]

WAC 296-155-61713 Safe operating procedure—Single-piece rim wheels. The employer shall establish a safe operating procedure for servicing single-piece rim wheels and shall assure that employees are instructed in and follow that procedure. The procedure shall include at least the following elements:

(1) Deflation. Tires shall be completely deflated by removal of the valve core before demounting.

(2) Mounting and demounting. Mounting and demounting of the tire shall be done only from the narrow ledge side of the wheel. Care shall be taken to avoid damaging the tire beads while mounting tires on wheels. Tires shall be mounted only on compatible wheels of matching bead diameter and width.

(3) Lubricant. Nonflammable rubber lubricant shall be applied to bead and wheel mating surfaces before assembly of the rim wheel, unless the tire or wheel manufacturer recommends against the use of any rubber lubricant.

(4) Changing machine. If a tire changing machine is used, the tire shall be inflated only to the minimum pressure necessary to force the tire bead onto the rim ledge while on the tire changing machine.

(5) Bead expander. If a bead expander is used, it shall be removed before the valve core is installed and as soon as the rim wheel becomes airtight (the tire bead slips onto the bead seat).

(6) Inflation restrictions. Tires may be inflated only when contained within a restraining device, positioned behind a barrier or bolted on the vehicle with the lug nuts fully tightened.

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(7) Inflation trajectory. Tires shall not be inflated when any flat, solid surface is in the trajectory and within one foot of the sidewall.

(8) Employee safety. Employees shall stay out of the trajectory when inflating a tire.

(9) Inflation pressure. Tires shall not be inflated to more than the inflation pressure stamped in the sidewall unless a higher pressure is recommended by the manufacturer.

(10) Seating tire bead. Tires shall not be inflated above the maximum pressure recommended by the manufacturer to

seat the tire bead firmly against the rim flange.

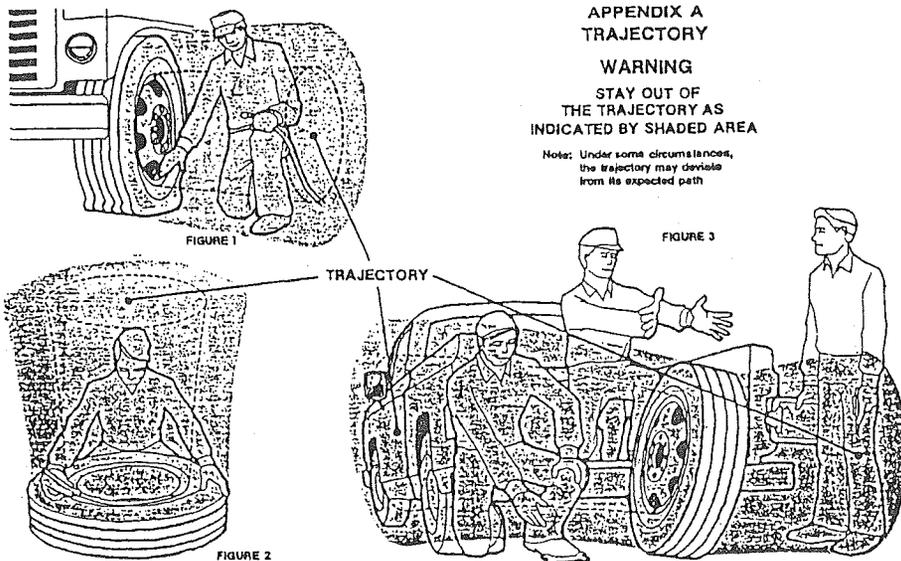
(11) Prohibition on use of heat. No heat shall be applied to a single-piece wheel.

(12) Mixing tire and rim sizes. Employee shall be informed of the hazard created by mixing 16" and 16.5" tires and rims.

(13) Defective components. Cracked, broken, bent, or otherwise damaged wheels shall not be reworked, welded, brazed, or otherwise heated.

APPENDIX A
TRAJECTORY
WARNING
STAY OUT OF
THE TRAJECTORY AS
INDICATED BY SHADED AREA

Note: Under some circumstances, the trajectory may deviate from its expected path.



Appendix B—Ordering Information for NHTSA charts

The NHTSA charts as part of a continuing campaign to alert rim wheel serving personnel of the industry accepted procedures for servicing multipiece rim wheels.

Prints of the charts are available through the Occupational Safety and Health Administration (OSHA) area offices. The address and telephone number of the nearest OSHA area office can be obtained by looking in the local telephone directory under U.S. Government, U.S. Department of Labor, Occupational Safety and Health Administration.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-61713, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-61713, filed 1/21/86.]

WAC 296-155-620 Pile driving equipment. (1) General requirements.

(f) Guards shall be provided across the top of the head

(a) Boilers and piping systems which are a part of, or used with, pile driving equipment shall meet the applicable requirements of the American Society of Mechanical Engineers, Powers Boilers (section I).

(b) All pressure vessels which are a part of or used with, pile driving equipment shall meet the applicable requirements of the American Society of Mechanical Engineers, Pressure Vessels (section VIII).

(c) Overhead protection, which will not obscure the vision of the operator, and which meets the requirements of Part L of this chapter, shall be provided. Protection shall be of 2-inch planking or other solid material of equivalent strength.

(d) Stop blocks shall be provided for the leads to prevent the hammer from being raised against the head block.

(e) A blocking device, capable of safely supporting the weight of the hammer shall be provided for placement in the leads under the hammer at all times while employees are working under the hammer.

block to prevent the cable from jumping out of the sheaves.

(g) When the leads must be inclined in the driving of batter piles, provisions shall be made to stabilize the leads.

(h) All working equipment shall be visually inspected at the beginning of each shift.

(i) Fixed leads shall be provided with ladder, and adequate rings, or similar attachment points, so that the loft workers may engage their full body harness lanyard to the leads. If the leads are provided with loft platform(s) such platform(s) shall be protected by standard guardrails.

(j) Pile drivers with swinging leads shall have a wire rope safety strap on top end.

(k) Spud bars shall be of hard wood with smooth round handle end for safe handling. Iron shod spud bars are prohibited.

(l) A follower block or driving cap shall be used with a drop hammer on all piling except sheet piling.

(m) Steam hose leading to a steam hammer or jet pipe shall be securely attached to the hammer with an adequate length of at least 1/4-inch diameter chain or cable to prevent whipping in the event the joint at the hammer is broken. Air hammer hoses shall be provided with the same protection as required for steam lines.

(n) Safety chains, or equivalent means, shall be provided for each hose connection to prevent the line from thrashing around in case the coupling becomes disconnected.

(o) Steam line controls shall consist of two shutoff valves, one of which shall be a quick-acting lever type within easy reach of the hammer operator.

(p) Guys, outriggers, thrustouts, or counterbalances shall be provided as necessary to maintain stability of pile driver rigs.

(q) Ladders constructed in compliance with this chapter shall be installed on all pile drivers from the hoist platform to the head block, and in such position that workers using ladders will not come in contact with lines, sheaves, etc.

(r) Drop hammers which have been chipped on the face shall not be used for pile driving.

(s) Groove worn drums or spools shall be replaced or properly repaired to present a smooth working surface.

(t) At least two full wraps of cable shall be maintained on hoisting drums.

(u) Proper racks shall be provided for storage of cross-cut saws.

(v) Every hoisting drum used as a pile driver shall be equipped with manually operated dogs or pawls to hold suspended loads. Foot brakes shall only be used to hold suspended loads until drum dogs are engaged. The dogs shall be visible from the operator's station or be equipped with a positive direct connected telltale which shall be visible to the operator.

(w) No counterweight or spring arrangement on dogs shall be permitted which would allow dog to be automatically disengaged either by relieving the load or rolling the drum.

(x) In every crew there shall be designated signalperson. The driver operator or drum person shall receive signals from no others, except when loftworker is above. The hammer shall not be lowered except on the loftworker's signal.

(y) Spliced hammer lines shall not be used. Planks. Walkways on pontoon lines may be equipped with

(2) Pile driving from barges and floats. Barges or floats supporting pile driving operations shall meet the applicable requirements of WAC 296-155-630.

(3) Pile driving equipment.

(a) Engineers and winchperson shall accept signals only from the designated signalperson.

(b) All employees shall be kept clear when piling is being hoisted into the leads.

(c) When piles are being driven in an excavated pit, the walls of the pit shall be sloped to the angle of repose or sheet-piled and braced.

(d) When steel tube piles are being "blown out," employees shall be kept well beyond the range of falling materials.

(e) When it is necessary to cut off the tops of driven piles, pile driving operations shall be suspended except where the cutting operations are located at least twice the length of the longest pile from the driver.

(f) When driving jacked piles, all access pits shall be provided with ladders and bulkheaded curbs to prevent material from falling into the pit.

(g) Floating equipment such as dredges and pile drivers shall maintain a signal system to shore in the event of an emergency.

(h) The distribution of machinery on floating equipment shall be such that the completed unit floats on an even keel.

(i) Fuel tanks below decks shall be vented to outside of hull and vents shall be equipped with flame arrestors.

(j) All hull compartments shall be ventilated. No person shall work in hull compartments until it is shown the compartments contain no flammable or toxic concentrations.

(k) Light fixtures installed or used within the hull shall be explosion proof.

(l) All floating rigs shall be equipped with ladderways extending from the deck to the waterline where the deck is more than 36 inches above the water. A wire rope shall be hung along both sides of the hull or float and so hung that it shall be at all times near or at the waterline.

(m) Doors of deck houses where deck house sets within 36" of edge of deck and doorways in hull shall be equipped with guard rails or cross chains.

(n) Deck houses shall have a substantial grab rail installed on all sides where such installation will not interfere with operations.

(o) Pile driver and dredge fairlead sheaves, and spudline sheaves shall be guarded to prevent workers or tools being drawn into them.

(p) All work deck shall be kept clear of debris, unnecessary tools and equipment in order to minimize the stumbling hazard. Lines shall be coiled, tools stored and material stacked clear of working spaces.

(q) Night operations shall be adequately lighted for all activity while work is in progress and shall be maintained until workers leave the work area.

(r) Electrical installation and equipment shall be installed and maintained in compliance with the National Electric Code.

(s) All walkways over water and on dredge pontoon discharge pipe lines shall be a minimum of 20" in width with standard handrail along one side on structures and gang hand lines in lieu of standard handrail.

(t) Adequate fire extinguishing equipment shall be provided and maintained in a serviceable condition.

(u) Protective equipment shall be used when working with creosote timbers. Protective creams shall be used on exposed skin surfaces and gloves and eye protection worn especially when driving piles.

(v) Pulling piles with hammer or pile line rigged through the head block is prohibited unless driver and rigging are designed to safely withstand the imposed strain.

(w) Truck runways and platforms shall be equipped with a wheel guard on all outside edges. Top of wheel guards shall be a minimum of 10 inches above deck.

(x) Use of foot blocks at base of leads for hammer line or pile line is prohibited.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-620, filed 7/20/94, effective 9/20/94; 91-03-044 (Order 90-18), § 296-155-620, filed 1/10/91, effective 2/12/91; Order 76-29, § 296-155-620, filed 9/30/76; Order 74-26, § 296-155-620, filed 5/7/74, effective 6/6/74.]

WAC 296-155-625 Site clearing. (1) General.

(a) The word "clearing" means the removal of trees, stumps, logs, brush, debris and rubbish from the surface of the ground in preparation of a site for construction work of any kind. The removal of trees and logs shall be in accordance with the requirements of chapter 296-54 WAC.

(b) All equipment and tools such as axes, sledges, wedges, saws, springboards, etc., shall be maintained in a safe condition and guarded with standard safeguards.

(c) Fallers shall give warning to brushing crews, buckers and other persons in the vicinity where a tree is being felled; taking notice that such persons are not only out of the reach of tree, but also out of danger of possible sidewinders, snags or other trees which may be knocked over by the tree being felled.

(d) No tree shall be felled toward and within range of traveled road or railroad in use, unless a flagger is placed on such road or railroad to warn all approaching persons or to stop vehicles.

(e) Clearing crews shall not be placed immediately below other crews working on hillsides where there is a possible danger of skidding or rolling trees, moving earth or rock.

(f) Pioneer roads on clearing operations shall be constructed to safely accommodate all equipment moved over road.

(g) Hazardous standing and down timber, rocks, etc., shall be moved from upper sides of cuts on side hill operations.

(h) Care shall be exercised in the use of oil for burning brush or timber.

(i) Employees engaged in site clearing shall be protected from hazards of irritant and toxic plants and suitably instructed in the first-aid treatment available.

(j) All equipment used in site clearing operations shall be equipped with rollover guards meeting the requirements of this chapter. In addition, rider-operated equipment shall be equipped with an overhead and rear canopy guard meeting the following requirements:

(i) The overhead covering on this canopy structure shall be of not less than 1/8-inch steel plate or 1/4-inch woven wire mesh with openings no greater than 1 inch, or equivalent.

(ii) The opening in the rear of the canopy structure shall be covered with not less than 1/4-inch woven wire mesh with openings no greater than 1 inch.

(iii) Use of 1/2 inch thick plastic sheets or other thicknesses of plastic panels derived from polycarbonate, acrylic, cellulose acetate butyrate which provides equivalent or better protection against particular hazards involved is acceptable in lieu of 1 or 1 3/4 inch open mesh material.

(A) All panels shall be installed in a manner which can withstand the initial impact, and maintain the protective barrier integrity; and

(B) All panels must be labeled or marked to distinguish between acceptable and inferior materials.

(k) In addition to observance of the general safety and health standards;

(i) The employer shall assume the responsibility of work assignment so that no worker shall be required to work in a position or location so isolated as to not be within ordinary calling distance of another person who can render assistance in case of emergency. In any operation where cutting, felling trees, loading, or a combination of these duties is carried on, there shall be a minimum crew of two persons who shall work as a team and shall be in visual or voice contact with one another. If one worker at these operations is required to be left alone for a period of time, the worker shall be contacted by another person at reasonable intervals not to exceed fifteen minutes unless such practice can be established to be impractical.

(ii) This does not apply to operators of motor vehicles, watchpersons or certain other jobs which, by their nature, are singular worker assignments. However, a definite procedure for checking the welfare of all workers during working hours shall be instituted and all workers so advised.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-625, filed 7/20/94, effective 9/20/94; 91-03-044 (Order 90-18), § 296-155-625, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-625, filed 1/21/86; Order 74-26, § 296-155-625, filed 5/7/74, effective 6/6/74.]

WAC 296-155-630 Marine operations and equipment. (1) Material handling operations.

Operations fitting the definition of "material handling" shall be performed in conformance with applicable requirements of "Safety and health regulations for longshoring." The term "longshoring operations" means the loading, unloading, moving, or handling of construction materials, equipment and supplies, etc. into, in, on, or out of any vessel, from a fixed structure or shore-to-vessel, vessel-to-shore or fixed structure or vessel-to-vessel.

(2) Access to barges.

(a) Ramps for access of vehicles to or between barges shall be of adequate strength, provided with side boards, well maintained, and properly secured.

(b) Unless employees can step safely to or from the wharf, float, barge, or river towboat, either a ramp, meeting the requirements of (a) of this subsection, or a safe walkway, shall be provided.

(c) Jacob's ladders shall be of the double rung or flat tread type. They shall be well maintained and properly secured.

(d) A Jacob's ladder shall either hang without slack from its lashings or be pulled up entirely.

(e) When the upper end of the means of access rests on or is flush with the top of the bulwark, substantial steps, properly secured and equipped with at least one substantial hand rail approximately 33 inches in height, shall be provided between the top of the bulwark and the deck.

(f) Obstructions shall not be laid on or across the gangway.

(g) The means of access shall be adequately illuminated for its full length.

(h) Unless the structure makes it impossible, the means of access shall be so located that the load will not pass over employees.

(3) Working surfaces of barges.

(a) Employees shall not be permitted to walk along the sides of covered lighters or barges with coamings more than 5 feet high, unless there is a 3-foot clear walkway, or a grab rail, or a taut handline is provided.

(b) Decks and other working surfaces shall be maintained in a safe condition.

(c) Employees shall not be permitted to pass fore and aft, over, or around deckloads, unless there is a safe passage.

(d) Employees shall not be permitted to walk over deckloads from rail to coaming unless there is a safe passage. If it is necessary to stand at the outboard or inboard edge of the deckload where less than 24 inches of bulwark, rail, coaming, or other protection exists, all employees shall be provided with a suitable means of protection against falling from the deckload.

(4) First-aid and lifesaving equipment.

(a) Provisions for rendering first aid and medical assistance shall be in accordance with Part B of this Chapter.

(b) The employer shall ensure that there is in the vicinity of each barge in use at least one U.S. Coast Guard-approved 30-inch life ring with not less than 90 feet of line attached, and at least one portable or permanent ladder which will reach the top of the apron to the surface of the water. If the above equipment is not available at the pier, the employer shall furnish it during the time that the employer is working the barge.

(c) Employees walking or working on the unguarded decks of barges shall be protected with U.S. Coast Guard-approved personal flotation devices such as Type I PFD, Type II PFD, Type III PFD, or Type V PFD, or their equivalent, pursuant to 46 CFR 160 (Coast Guard Lifesaving Equipment Specifications) and 33 CFR 175.23 (Coast Guard table of devices equivalent to personal flotation devices). Ski belt or inflatable type personal flotation devices are specifically prohibited.

(5) Diving operations. (Reserved.)

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-630, filed 7/20/94, effective 9/20/94; Order 76-29, § 296-155-630, filed 9/30/76; Order 74-26, § 296-155-630, filed 5/7/74, effective 6/6/74.]

PART N

EXCAVATION, TRENCHING, AND SHORING

WAC 296-155-650 Scope, application, and definitions applicable to this part. (1) Scope and application. This part

(1999 Ed.)

applies to all open excavations made in the earth's surface. Excavations are defined to include trenches.

(2) Definitions applicable to this part.

(a) "Accepted engineering requirements or practices." Those requirements which are compatible with standards of practice required by a registered professional engineer.

(b) "Aluminum hydraulic shoring." A preengineered shoring system comprised of aluminum hydraulic cylinders (crossbraces) used in conjunction with vertical rails (uprights) or horizontal rails (walers). Such system is designed, specifically to support the sidewalls of an excavation and prevent cave-ins.

(c) "Bell-bottom pier hole." A type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.

(d) "Benching (benching system)." A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

(e) "Cave-in." The separation of a mass of soil or rock material from the side of an excavation, or loss of soil from under a trench shield or support system, and its sudden movement into the excavation in quantity that it could entrap, bury, injure, or immobilize a person.

(f) "Competent person." One who can identify existing or predictable hazards in the surroundings that are unsanitary, hazardous, or dangerous to employees. Also has authorization or authority by the nature of their position to take prompt corrective measures to eliminate them. The person shall be knowledgeable in the requirements of this part.

(g) "Cross braces." The horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

(h) "Excavation." Any person-made cut, cavity, trench, or depression in the earth's surface, formed by earth removal.

(i) "Faces or sides." The vertical or inclined earth surfaces formed as a result of excavation work.

(j) "Failure." The breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

(k) "Hazardous atmosphere." A atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

(l) "Kickouts." Accidental release or failure of a cross brace.

(m) "Protective system." A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

(n) "Ramp." An inclined walking or working surface that is used to gain access to one point to another, and is constructed from earth or from structural materials such as steel or wood.

(o) "Registered professional engineer." A person who is registered as a professional engineer in the state of Washing-

[Title 296 WAC—p. 2307]

ton. The registered professional engineer shall comply with the Washington state department of licensing requirements, chapter 18.43 RCW.

(p) "Sheeting." The members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

(q) "Shield (shield system)." A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either premanufactured or job-built in accordance with WAC 296-155-657 (3)(c) or (d). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

(r) "Shoring (shoring system)." A structure such as a metal hydraulic, mechanical, or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

(s) "Sides." See "faces."

(t) "Sloping (sloping system)." A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

(u) "Stable rock." A natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

(v) "Structural ramp." A ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.

(w) "Support system." A structure such as underpinning, bracing or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

(x) "Tabulated data." Tables and charts approved by a registered professional engineer and used to design and construct a protective system.

(y) "Trench (trench excavation)." A narrow excavation in relation to its length made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

(z) Trench box. See "shield."

(aa) "Trench shield." See "shield."

(bb) "Uprights." The vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

(cc) "Wales." Horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-650, filed 7/20/94, effective 9/20/94. Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-650, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-650, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-650, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-650, filed 6/17/81; Order 74-26, § 296-155-650, filed 5/7/74, effective 6/6/74.]

WAC 296-155-655 General protection requirements.

(1) Surface encumbrances. All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.

(2) Underground installations.

(a) The location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be located prior to opening an excavation.

(b) Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to locate the underground utility installation prior to the start of actual excavation.

(c) When excavation operations approach the location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.

(d) While the excavation is open, underground installations shall be protected, supported, or removed as necessary to safeguard employees.

(3) Access and egress.

(a) Structural ramps.

(i) Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design, and shall be constructed in accordance with the design.

(ii) Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.

(iii) Structural members used for ramps and runways shall be of uniform thickness.

(iv) Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.

(v) Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.

(b) Means of egress from trench excavations. A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.

(4) Exposure to vehicular traffic. Employees exposed to public vehicular traffic shall be provided with, and shall

wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

(5) Exposure to falling loads. No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with WAC 296-155-610 (2)(g), to provide adequate protection for the operator during loading and unloading operations.

(6) Warning system for mobile equipment. When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

(7) Hazardous atmospheres.

(a) Testing and controls. In addition to the requirements set forth in parts B-1, C, and C-1 of this chapter (296-155 WAC) to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:

(i) Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.

(ii) Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation in accordance with parts B-1 and C of this chapter respectively.

(iii) Adequate precaution shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.

(iv) When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

(b) Emergency rescue equipment.

(i) Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.

(ii) Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

Note: See chapter 296-62 WAC, Part M for additional requirements applicable to confined space operations.

(8) Protection from hazards associated with water accumulation.

(a) Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

(b) If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.

(c) If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person and compliance with subdivisions (a) and (b) of this subsection.

(9) Stability of adjacent structures.

(a) Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

(b) Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:

(i) A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or

(ii) The excavation is in stable rock; or

(iii) A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or

(iv) A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

(c) Sidewalks, pavements, and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

(10) Protection of employees from loose rock or soil.

(a) Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide equivalent protection.

(b) Employees shall be protected from excavated or other materials or equipment that could pose a hazard by fall-

ing or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

(11) Inspections.

(a) Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

(b) Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

(12) Fall protection.

(a) Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails which comply with chapter 296-155 WAC, Part K shall be provided where walkways are 4 feet or more above lower levels.

(b) Adequate barrier physical protection shall be provided at all remotely located excavations. All wells, pits, shafts, etc., shall be barricaded or covered. Upon completion of exploration and similar operations, temporary wells, pits, shafts, etc., shall be backfilled.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-655, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-655, filed 4/25/95, effective 10/1/95. Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17.]050 and [49.17.]060. 92-22-067 (Order 92-06), § 296-155-655, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-655, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-655, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-655, filed 6/17/81; Order 76-29, § 296-155-655, filed 9/30/76; Order 74-26, § 296-155-655, filed 5/7/74, effective 6/6/74.]

➤ **WAC 296-155-657 Requirements for protective systems.** (1) Protection of employees in excavations.

(a) Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with subsections (2) or (3) of this section except when:

(i) Excavations are made entirely in stable rock; or

(ii) Excavations are less than 4 feet (1.22m) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

(b) Protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

(2) Design of sloping and benching systems. The slopes and configurations of sloping and benching systems shall be

selected and constructed by the employer or employer's designee and shall be in accordance with the requirements of subdivision (a); or, in the alternative, subdivision (b); or, in the alternative, subdivision (c); or, in the alternative, subdivision (d), as follows:

(a) Option 1—Allowable configurations and slopes.

(i) Excavations shall be sloped at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal), unless the employer uses one of the other options listed below.

(ii) Slopes specified in item (i) of this subdivision, shall be excavated to form configurations that are in accordance with the slopes shown for Type C soil in Appendix B to this part.

(b) Option 2—Determination of slopes and configurations using Appendices A and B. Maximum allowable slopes, and allowable configurations for sloping and benching systems, shall be determined in accordance with the conditions and requirements set forth in appendices A and B to this part.

(c) Option 3—Designs using other tabulated data.

(i) Designs of sloping or benching systems shall be selected from and be in accordance with tabulated data, such as tables and charts.

(ii) The tabulated data shall be in written form and shall include all of the following:

(A) Identification of the parameters that affect the selection of a sloping or benching system drawn from such data;

(B) Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe;

(C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

(iii) At least one copy of the tabulated data which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the director upon request.

(d) Option 4—Design by a registered professional engineer.

(i) Sloping and benching systems not utilizing Option 1 or Option 2 or Option 3 under subsection (2) of this section shall be approved by a registered professional engineer.

(ii) Designs shall be in written form and shall include at least the following:

(A) The magnitude of the slopes that were determined to be safe for the particular project;

(B) The configurations that were determined to be safe for the particular project; and

(C) The identity of the registered professional engineer approving the design.

(iii) At least one copy of the design shall be maintained at the jobsite while the slope is being constructed. After that time the design need not be at the jobsite, but a copy shall be made available to the director upon request.

(3) Design of support systems, shield systems, and other protective systems. Designs of support systems, shield systems, and other protective systems shall be selected and constructed by the employer or employer's designee and shall be

in accordance with the requirements of subdivision (a); or, in the alternative, subdivision (b); or, in the alternative, subdivision (c); or, in the alternative, subdivision (d) as follows:

(a) Option 1—Designs using appendices A, C, and D. Designs for timber shoring in trenches shall be determined in accordance with the conditions and requirements set forth in appendices A and C to this part. Designs for aluminum hydraulic shoring shall be in accordance with subdivision (b) of this subsection, but if manufacturer's tabulated data cannot be utilized, designs shall be in accordance with appendix D.

(b) Option 2—Designs using manufacturer's tabulated data.

(i) Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data shall be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

(ii) Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer shall only be allowed after the manufacturer issues specific written approval.

(iii) Manufacturer's specifications, recommendations, and limitations, and manufacturer's approval to deviate from the specifications, recommendations, and limitations shall be in written form at the jobsite during construction of the protective system. After that time this data may be stored off the jobsite, but a copy shall be made available to the director upon request.

(c) Option 3—Designs using other tabulated data.

(i) Designs of support systems, shield systems, or other protective systems shall be selected from and be in accordance with tabulated data, such as tables and charts.

(ii) The tabulated data shall be in written form and include all of the following:

(A) Identification of the parameters that affect the selection of a protective system drawn from such data;

(B) Identification of the limits of use of the data;

(C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

(iii) At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the director upon request.

(d) Option 4—Design by a registered professional engineer.

(i) Support systems, shield systems, and other protective systems not utilizing Option 1, Option 2 or Option 3, above, shall be approved by a registered professional engineer.

(ii) Designs shall be in written form and shall include the following:

(A) A plan indicating the sizes, types, and configurations of the materials to be used in the protective system; and

(B) The identity of the registered professional engineer approving the design.

(iii) At least one copy of the design shall be maintained at the jobsite during construction of the protective system. After that time, the design may be stored off the jobsite, but a

copy of the design shall be made available to the director upon request.

(4) Materials and equipment.

(a) Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function.

(b) Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.

(c) When material or equipment that is used for protective systems is damaged, a competent person shall examine the material or equipment and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service, and shall be evaluated and approved by a registered professional engineer before being returned to service.

(5) Installation and removal of support.

(a) General.

(i) Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.

(ii) Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

(iii) Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.

(iv) Before temporary removal of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.

(v) Removal shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.

(vi) Backfilling shall progress together with the removal of support systems from excavations.

(b) Additional requirements for support systems for trench excavations.

(i) Excavation of material to a level no greater than 2 feet (.61 m) below the bottom of the members of a support system shall be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

(ii) Installation of a support system shall be closely coordinated with the excavation of trenches.

(6) Sloping and benching systems. Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.

(7) Shield systems.

(a) General.

(i) Shield systems shall not be subjected to loads exceeding those which the system was designed to withstand.

(ii) Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.

(iii) Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.

(iv) Employees shall not be allowed in shields when shields are being installed, removed, or moved vertically.

(b) Additional requirement for shield systems used in trench excavations. Excavations of earth material to a level not greater than 2 feet (.61 m) below the bottom of a shield shall be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield.

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-657, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-657, filed 1/10/91, effective 2/12/91.]

WAC 296-155-66103 Reserved.

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-66103, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-66103, filed 1/10/91, effective 2/12/91.]

WAC 296-155-66105 Reserved.

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-66105, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-66105, filed 1/10/91, effective 2/12/91.]

WAC 296-155-66109 Reserved.

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-66109, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-66109, filed 1/10/91, effective 2/12/91.]

WAC 296-155-664 Appendices.

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-664, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-664, filed 1/10/91, effective 2/12/91.]

WAC 296-155-66401 Appendix A—Soil classification. (1) Scope and application.

(a) Scope. This appendix describes a method of classifying soil and rock deposits based on site and environmental conditions, and on the structure and composition of the earth deposits. The appendix contains definitions, sets forth requirements, and describes acceptable visual and manual tests for use in classifying soils.

(b) Application. This appendix applies when a sloping or benching system is designed in accordance with the requirements set forth in WAC 296-155-657 (2)(b) as a method of protection for employees from cave-ins. This appendix also applies when timber shoring for excavations is designed as a method of protection from cave-ins in accordance with appendix C to part N of this chapter, and when aluminum

hydraulic shoring is designed in accordance with appendix D. This Appendix also applies if other protective systems are designed and selected for use from data prepared in accordance with the requirements set forth in WAC 296-155-657(3), and the use of the data is predicated on the use of the soil classification system set forth in this appendix.

(2) Definitions. The definitions and examples given below are based on, in whole or in part, the following; American Society for Testing Materials (ASTM) Standards D653-85 and D2488; The Unified Soils Classification System, The U.S. Department of Agriculture (USDA) Textural Classification Scheme; and The National Bureau of Standards Report BSS-121.

(a) Cemented soil. A soil in which the particles are held together by a chemical agent, such as calcium carbonate such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.

(b) Cohesive soil. Clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical sideslopes, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.

(c) Dry soil. Soil that does not exhibit visible signs of moisture content.

(d) Fissured. A soil material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.

(e) Granular soil. Gravel, sand, or silt, (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

(f) Layered system. Two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered.

(g) Moist soil. A condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.

(h) Plastic. A property of a soil which allows the soil to be deformed or molded without cracking, or appreciable volume change.

(i) Saturated soil. A soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrometer or shear vane.

(j) Soil classification system. For the purpose of this part, a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the environmental conditions of exposure.

(k) Stable rock. Natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

(l) Submerged soil. Soil which is underwater or is free seeping.

(m) Type A. Cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils are: Clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. No soil is Type A if:

(i) The soil is fissured; or

(ii) The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or

(iii) The soil has been previously disturbed; or

(iv) The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of 4 horizontal to 1 vertical (4H.1V) or greater; or

(v) The material is subject to other factors that would require it to be classified as a less stable material.

(n) Type B.

(i) Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa): or

(ii) Granular cohesionless soils including: Angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.

(iii) Previously disturbed soils except those which would otherwise be classed as Type C soil.

(iv) Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration: or

(v) Dry rock that is not stable: or

(vi) Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than 4 horizontal to 1 vertical (4H.1V), but only if the material would otherwise be classified as Type B.

(o) Type C.

(i) Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less: or

(ii) Granular soils including gravel, sand, and loamy sand: or

(iii) Submerged soil or soil from which water is freely seeping: or

(iv) Submerged rock that is not stable, or

(v) Material in a sloped, layered system where the layers dip into the excavation on a slope of 4 horizontal to 1 vertical (4H.1V) or steeper.

(p) Unconfined compressive strength. The load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.

(q) Wet soil. Soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated. Granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

(3) Requirements.

(a) Classification of soil and rock deposits. Each soil and rock deposit shall be classified by a competent person as Stable Rock, Type A, Type B, or Type C in accordance with the definitions set forth in subsection (2) of this section.

(b) Basis of classification. The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis. Such analyses shall be conducted by a competent person using tests in subsection (4) of this section or in other recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture textural classification system.

(c) Visual and manual analyses. The visual and manual analyses, such as those noted as being acceptable in subsection (4) of this section, shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to identify properly the properties, factors, and conditions affecting the classification of the deposits.

(d) Layered systems. In a layered system, the system shall be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer.

(e) Reclassification. If, after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, the changes shall be evaluated by a competent person. The deposit shall be reclassified as necessary to reflect the changed circumstances.

(4) Acceptable visual and manual tests.

(a) Visual tests. Visual analysis is conducted to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken as samples from excavated material.

(i) Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.

(ii) Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps is granular.

(iii) Observe the side of the opened excavation and the surface area adjacent to the excavation. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil spall off a vertical side, the soil could be fissured. Small spalls are evidence of moving ground and are indications of potentially hazardous situations.

(iv) Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures, and to identify previously disturbed soil.

(v) Observe the opened side of the excavation to identify layered systems. Examine layered systems to identify if the layers slope toward the excavation. Estimate the degree of slope of the layers.

(vi) Observe the area adjacent to the excavation and sides of the open excavation for evidence of surface water, water seeping from the sides of the excavation, or the location of the level of the water table.

(vii) Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.

(b) Manual tests. Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly.

(i) Plasticity. Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/8-inch in diameter. Cohesive material can be successfully rolled into threads without crumbling. For example, if at least a 2 inch (50 mm) length of 1/8-inch thread can be held on one end without tearing, the soil is cohesive.

(ii) Dry strength. If the soil is dry and crumbles on its own or with moderate pressure into individual grains or fine powder, it is granular (any combination of gravel, sand, or silt). If the soil is dry and falls into clumps which break up into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand or silt. If the dry soil breaks into clumps which do not break up into small clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered unfissured.

(iii) Thumb penetration. The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. (This test is based on the thumb penetration test described in American Society for Testing and Materials (ASTM) Standard designation D2488-"Standard Recommended Practice for Description of Soils (Visual—Manual Procedure).") Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be and penetrated by the thumb only with very great effort. Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molded by light finger pressure. This test should be conducted on an undisturbed soil sample, such as a large clump of spoil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences. If the excavation is later exposed to wetting influences (rain, flooding), the classification of the soil must be changed accordingly.

(iv) Other strength tests. Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetrometer or by using a hand-operated shear vane.

(v) Drying test. The basic purpose of the drying test is to differentiate between cohesive material with fissures, unfissured cohesive material, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately 1 inch thick (2.54 cm) and 6 inches (15.24 cm) in diameter until it is thoroughly dry:

(A) If the sample develops cracks as it dries, significant fissures are indicated.

(B) Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as a unfissured cohesive material and the unconfined compressive strength should be determined.

(C) If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular.

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060, 92-22-067 (Order 92-06), § 296-155-66401, filed 10/30/92, effective 12/8/92.]

WAC 296-155-66403 Appendix B—Sloping and benching. (1) Scope and application. This appendix contains specifications for sloping and benching when used as methods of protecting employees working in excavations from cave-ins. The requirements of this appendix apply when the design of sloping and benching protective systems is to be performed in accordance with the requirements set forth in WAC 296-155-657 (2)(b).

(2) Definitions.

(a) Actual slope. The slope to which an excavation face is excavated.

(b) Distress. Soil that is in a condition where a cave-in is imminent or is likely to occur. Distress is evidenced by such phenomena as the development of fissures in the face of or adjacent to an open excavation; the subsidence of the edge of an excavation; the slumping of material from the face or the bulging or heaving of material from the bottom of an excavation; the spalling of material from the face of an excavation; and raveling, i.e., small amounts of material such as pebbles or little clumps of material suddenly separating from the face of an excavation and trickling or rolling down into the excavation.

(c) Maximum allowable slope. The steepest incline of an excavation face that is acceptable for the most favorable site conditions as protection against cave-ins, and is expressed as the ratio of horizontal distance to vertical rise (H:V).

(3) Requirements.

(a) Soil classification. Soil and rock deposits shall be classified in accordance with appendix A of this Part.

(b) Maximum allowable slope. The maximum allowable slope for a soil or rock deposit shall be determined from Table N-1 of this appendix.

(c) Actual slope.

(i) The actual slope shall not be steeper than the maximum allowable slope.

(ii) The actual slope shall be less steep than the maximum allowable slope, when there are signs of distress. If that situation occurs, the slope shall be cut back to an actual slope which is at least 1/2 horizontal to one vertical (1/2H:1V) less steep than the maximum allowable slope.

(iii) When surcharge loads from stored material or equipment, operating equipment, or traffic are present, a competent person shall determine the degree to which the actual slope must be reduced below the maximum allowable slope, and shall assure that such reduction is achieved. Surcharge loads from adjacent structures shall be evaluated in accordance with WAC 296-155-655(9).

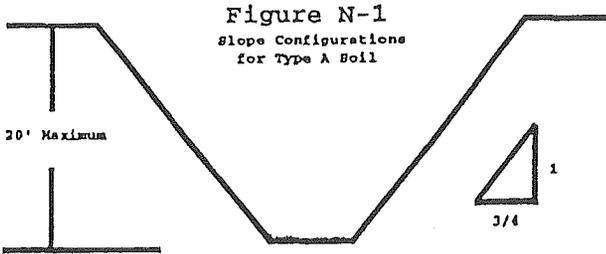
(d) Configurations. Configurations of sloping and benching systems shall be in accordance with Figures N-1 through N-18.

TABLE N-1
MAXIMUM ALLOWABLE SLOPES

SOIL OR ROCK TYPE	MAXIMUM ALLOWABLE SLOPES (H ₁ V) ⁽¹⁾ FOR EXCAVATION LESS THAN 20 FEET DEEP ⁽²⁾
STABLE ROCK	VERTICAL (90°)
TYPE A	3/4 : 1 (53°)
TYPE B	1 : 1 (45°)
TYPE C	1 1/2 : 1 (34°)

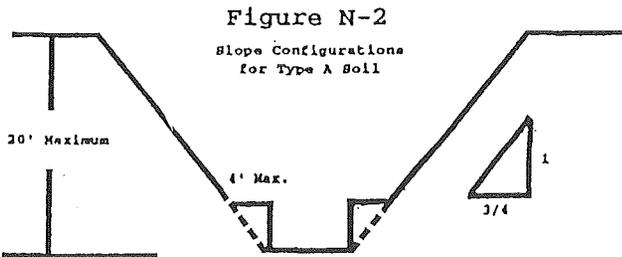
Notes:

- (1) Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.
- (2) Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.



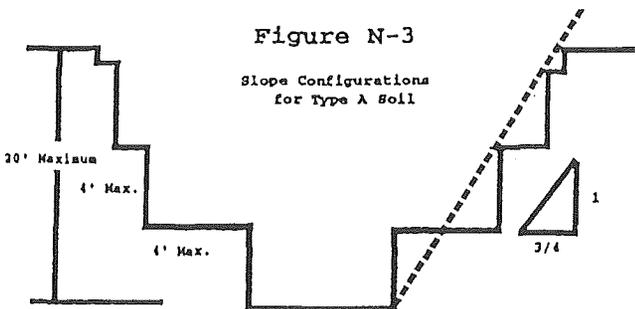
Simple Slope - General

All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4:1



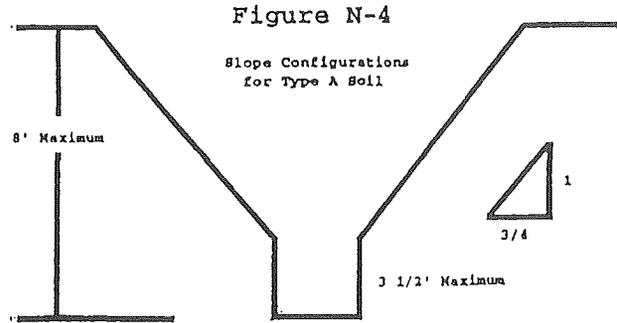
Simple Bench

All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4 to 1 and maximum bench dimensions of 4 feet.



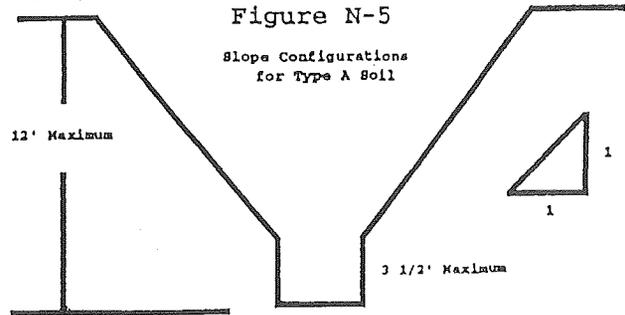
Multiple Bench

All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4:1 and maximum bench dimensions of 4 feet.



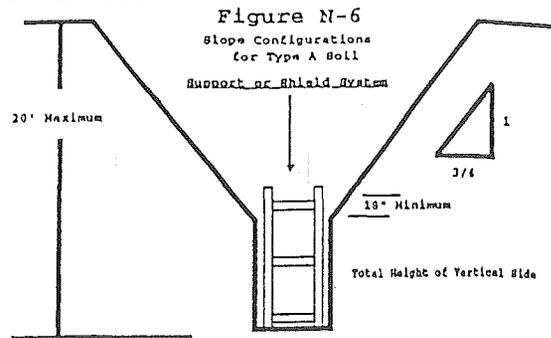
Unsupported Vertically Sided Lower Portion -- Maximum 8 feet in Depth

All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3 1/2 feet.



Unsupported Vertically Sided Lower Portion -- Maximum 12 feet in Depth

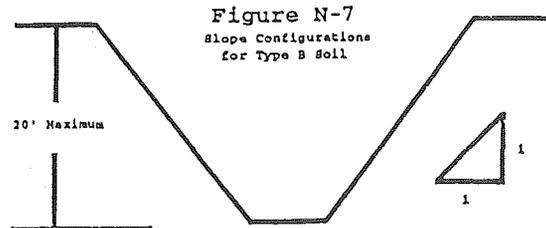
All excavations more than 8 feet but not more than 12 feet in depth with unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3 1/2 feet.



Unsupported Vertically Sided Lower Portion -- Maximum 12 feet in Depth

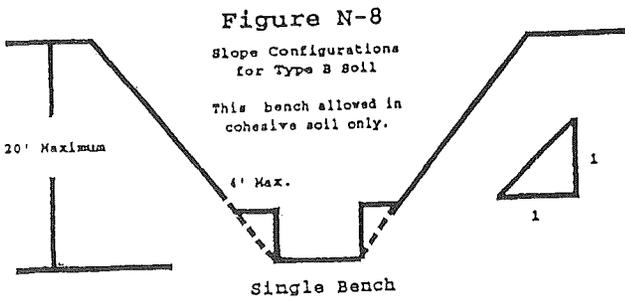
All excavations 16 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of 3/4:1. The support or shield system must extend at least 18 inches above the top of the vertical side.

All other slope slopes, compound slopes, and vertically sided lower portions excavations shall be in accordance with other options permitted under WAC 296-155-66403.

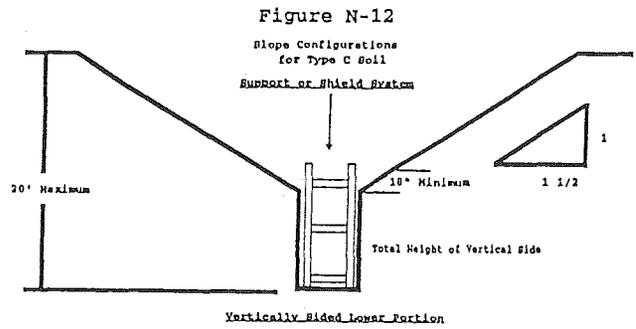


Simple Slope

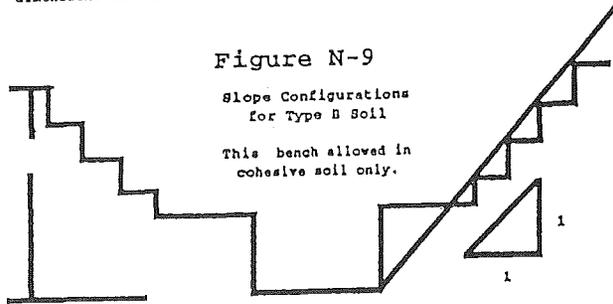
All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1



All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions of 4 feet.



All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1 1/2:1.



All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions of 4 feet.

EXCAVATIONS MADE IN LAYERED SOILS

All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.

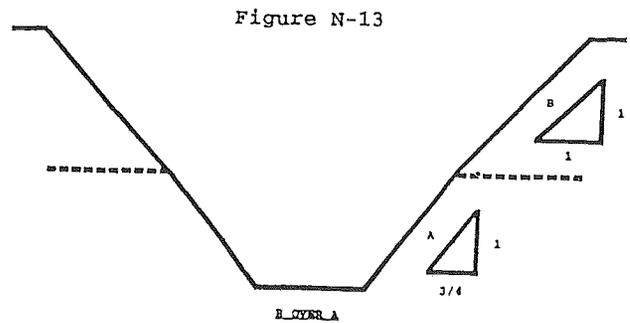
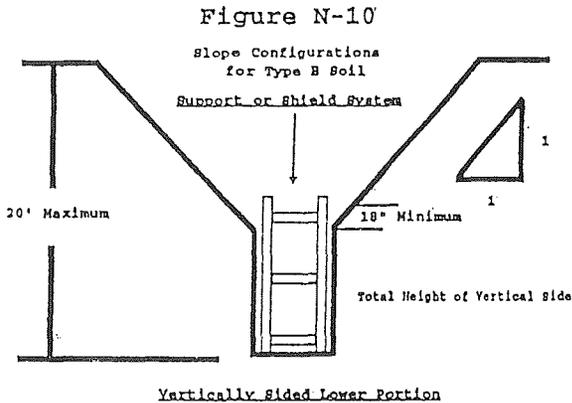
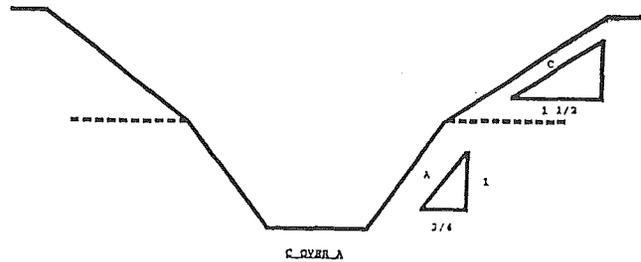
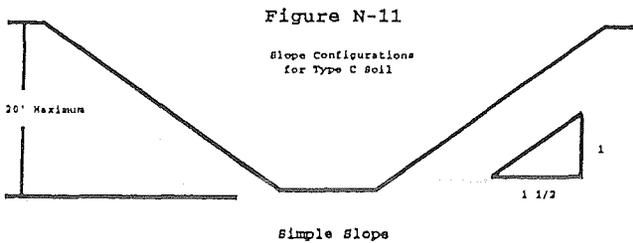


Figure N-14



All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.



All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1 1/2:1.

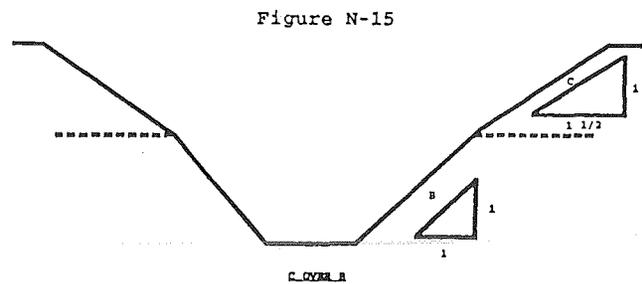


Figure N-16

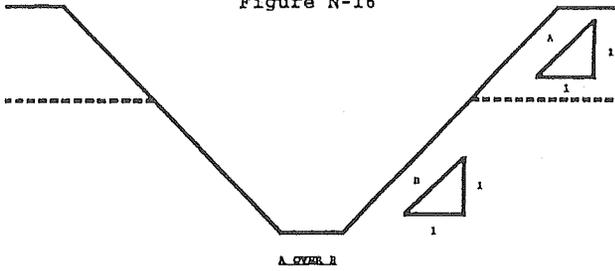


Figure N-17

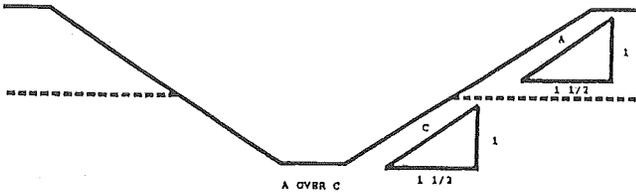
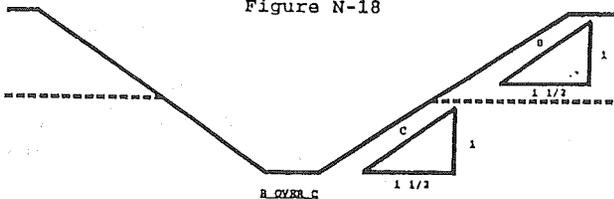


Figure N-18



[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060, 92-22-067 (Order 92-06), § 296-155-66403, filed 10/30/92, effective 12/8/92.]

WAC 296-155-66405 Appendix C—Timber shoring for trenches. (1) Scope. This appendix contains information that can be used when timber shoring is provided as a method of protection from cave-ins in trenches that do not exceed 20 feet (6.1 m) in depth. This appendix must be used when design of timber shoring protective systems is to be performed in accordance with WAC 296-155-657 (3)(a). Other timber shoring configurations; other systems of support such as hydraulic and pneumatic systems; and other protective systems such as sloping, benching, shielding, and freezing systems must be designed in accordance with the requirements set forth in WAC 296-155-657 (2) and (3).

(2) Soil classification. In order to use the data presented in this appendix, the soil type or types in which the excavation is made must first be determined using the soil classification method set forth in appendix A of this part.

(3) Presentation of information. Information is presented in several forms as follows:

(a) Information is presented in tabular form in Tables N-2 through N-7 following subsection (7) of this appendix. Each table presents the minimum sizes of timber members to use in a shoring system, and each table contains data only for the particular soil type in which the excavation or portion of

the excavation is made. The data are arranged to allow the user the flexibility to select from among several acceptable configurations of members based on varying the horizontal spacing of the crossbraces. Stable rock is exempt from shoring requirements and therefore, no data are presented for this condition.

(b) Information concerning the basis of the tabular data and the limitations of the data is presented in subsection (4) of this appendix, and on the tables themselves.

(c) Information explaining the use of the tabular data is presented in subsection (5) of this appendix.

(d) Information illustrating the use of the tabular data is presented in subsection (6) of this appendix.

(e) Miscellaneous notations regarding Tables N-2 through N-7 are presented in subsection (7) of this Appendix.

(4) Basis and limitations of the data.

(a) Dimensions of timber members.

(i) The sizes of the timber members listed in Tables N-2 through N-7 are taken from the National Bureau of Standards (NBS) report, "Recommended Technical Provisions for Construction Practice in Shoring and Sloping of Trenches and Excavations." In addition, where NBS did not recommend specific sizes of members, member sizes are based on an analysis of the sizes required for use by existing codes and on empirical practice.

(ii) The required dimensions of the members listed in Tables N-2, N-3, and N-4 refer to actual dimensions and not nominal dimensions of the timber. Employers wanting to use nominal size shoring are directed to Tables N-5, N-6, and N-7, or have this choice under WAC 296-155-657 (3)(c), and are referred to The Corps of Engineers, The Bureau of Reclamation or data from other acceptable sources.

(b) Limitation of application.

(i) It is not intended that the timber shoring specification apply to every situation that may be experienced in the field. These data were developed to apply to the situations that are most commonly experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this appendix must be designed as specified in WAC 296-155-657(3).

(ii) When any of the following conditions are present, the members specified in the tables are not considered adequate. Either an alternate timber shoring system must be designed or another type of protective system designed in accordance with WAC 296-155-657.

(A) When loads imposed by structures or by stored material adjacent to the trench weigh in excess of the load imposed by a two-foot soil surcharge. The term "adjacent" as used here means the area within a horizontal distance from the edge of the trench equal to the depth of the trench.

(B) When vertical loads imposed on cross braces exceed a 240-pound gravity load distributed on a one-foot section of the center of the crossbrace.

(C) When surcharge loads are present from equipment weighing in excess of 20,000 pounds.

(D) When only the lower portion of a trench is shored and the remaining portion of the trench is sloped or benched unless: The sloped portion is sloped at an angle less steep than three horizontal to one vertical; or the members are selected from the tables for use at a depth which is deter-

mined from the top of the overall trench, and not from the toe of the sloped portion.

(5) Use of Tables. The members of the shoring system that are to be selected using this information are the cross braces, the uprights, and the wales, where wales are required. Minimum sizes of members are specified for use in different types of soil. There are six tables of information, two for each soil type. The soil type must first be determined in accordance with the soil classification system described in appendix A of this Part. Using the appropriate table, the selection of the size and spacing of the members is then made. The selection is based on the depth and width of the trench where the members are to be installed and, in most instances, the selection is also based on the horizontal spacing of the crossbraces. Instances where a choice of horizontal spacing of crossbracing is available, the horizontal spacing of the crossbraces must be chosen by the user before the size of any member can be determined. When the soil type, the width and depth of the trench, and the horizontal spacing of the crossbraces are known, the size and vertical spacing of the crossbraces, the size and vertical spacing of the wales, and the size and horizontal spacing of the uprights can be read from the appropriate table.

(6) Examples to illustrate the use of Tables N-2 through N-4.

(a) Example 1.

A trench dug in Type A soil is 13 feet deep and five feet wide.

From Table N-2, for acceptable arrangements of timber can be used.

Arrangement #1

Space 4x4 crossbraces at six feet horizontally and four feet vertically.

Wales are not required.

Space 3x8 uprights at six feet horizontally. This arrangement is commonly called "skip shoring."

Arrangement #2

Space 4x6 crossbraces at eight feet horizontally and four feet vertically.

Space 8x8 wales at four feet vertically.

Space 2x6 uprights at four feet horizontally.

Arrangement #3

Space 6x6 crossbraces at 10 feet horizontally and four feet vertically.

Space 8x10 wales at four feet vertically.

Space 2x6 uprights at five feet horizontally.

Arrangement #4

Space 6x6 crossbraces at 12 feet horizontally and four feet vertically.

Space 10x10 wales at four feet vertically.

Space 3x8 uprights at six feet horizontally.

(b) Example 2.

A trench dug in Type B soil in 13 feet deep and five feet wide.

From Table N-3 three acceptable arrangements of members are listed.

Arrangement #1

Space 6x6 crossbraces at six feet horizontally and five feet vertically.

Space 8x8 wales at five feet vertically.

Space 2x6 uprights at two feet horizontally.

Arrangement #2

Space 6x8 crossbraces at eight feet horizontally and five feet vertically.

Space 10x10 wales at five feet vertically.

Space 2x6 uprights at two feet horizontally.

Arrangement #3

Space 8x8 crossbraces at 10 feet horizontally and five feet vertically.

Space 10x12 wales at five feet vertically.

Space 2x6 uprights at two feet vertically.

(c) Example 3.

A trench dug Type C soil is 13 feet deep and five feet wide.

From Table N-4 two acceptable arrangements of members can be used.

Arrangement #1

Space 8x8 crossbraces at six feet horizontally and five feet vertically.

Space 10x12 wales at five feet vertically.

Position 2x6 uprights as closely together as possible.

If water must be retained use special tongue and groove uprights to form tight sheeting.

Arrangement #2

Space 8x10 crossbraces at eight feet horizontally and five feet vertically.

Space 12x12 wales at five feet vertically.

Position 2x6 uprights in a close sheeting configuration unless water pressure must be resisted. Tight sheeting must be used where water must be retained.

(d) Example 4.

A trench dug in Type C soil is 20 feet deep and 11 feet wide. The size and spacing of members for the section of trench that is over 15 feet in depth is determined using Table N-4. Only one arrangement of members is provided.

Space 8x10 crossbraces at six feet horizontally and five feet vertically.

Space 12x12 wales at five feet vertically.

Use 3x6 tight sheeting.

Use of Tables N-5, N-6, and N-7 would follow the same procedures.

(7) Notes for all tables.

(a) Member sizes at spacings other than indicated are to be determined as specified in WAC 296-155-657(3). "Design of Protective Systems."

(b) When conditions are saturated or submerged use Tight Sheeting. Tight Sheeting refers to the use of specially-edged timber planks (e.g., tongue and groove) at least three inches thick, steel sheet piling, or similar construction that when driven or placed in position provide a tight wall to resist the lateral pressure of water and to prevent the loss of backfill

material. Close Sheeting refers to the placement of planks side-by-side allowing as little space as possible between them.

(c) All spacing indicated is measured center to center.

(d) Wales to be installed with greater dimension horizontal.

(e) If the vertical distance from the center of the lowest crossbrace to the bottom of the trench exceeds two and one-half feet, uprights shall be firmly embedded or a mudsill shall be used. Where uprights are embedded, the vertical distance from the center of the lowest crossbrace to the bottom of the trench shall not exceed 36 inches. When mudsills are used, the vertical distance shall not exceed 42 inches. Mudsills are wales that are installed at the toe of the trench side.

(f) Trench jacks may be used in lieu of or in combination with timber crossbraces.

(g) Placement of crossbraces. When the vertical spacing of crossbraces is four feet, place the top crossbrace no more than two feet below the top of the trench. When the vertical spacing of crossbraces is five feet, place the top crossbrace no more than 2.5 feet below the top of the trench.

TABLE H-4
TIMBER TRENCH SHORING - MINIMUM TIMBER REQUIREMENTS *
SOIL TYPE C P₁ - 20 X 11 + 75 psf (1 ft. surcharge)

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS **										
	HORIZ. SPACING (FEET)	CROSS BRACES					VERT. SPACING (FEET)	WALES		MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)	UPRIGHTS
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15		SIZE (IN)	SPACING (FEET)			CLOSE
4	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 6	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
10	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 10	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
16	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 16	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
20	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 20	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
OVER 20	SEE NOTE 1										

* 14' x 12' oak or equivalent with a bending strength not less than 450 psi.
** All manufactured members of equivalent strength may be substituted for wood.

TABLE H-5

TIMBER TRENCH SHORING - MINIMUM TIMBER REQUIREMENTS *
SOIL TYPE A P₁ - 25 X 11 + 75 psf (1 ft. surcharge)

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS **										
	HORIZ. SPACING (FEET)	CROSS BRACES					VERT. SPACING (FEET)	WALES		MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)	UPRIGHTS
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15		SIZE (IN)	SPACING (FEET)			CLOSE
4	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 6	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
10	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 10	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
16	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 16	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
20	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 20	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
OVER 20	SEE NOTE 1										

* 14' x 12' oak or equivalent with a bending strength not less than 450 psi.
** All manufactured members of equivalent strength may be substituted for wood.

TABLE H-6

TIMBER TRENCH SHORING - MINIMUM TIMBER REQUIREMENTS *
SOIL TYPE B P₁ - 45 X 11 + 75 psf (1 ft. surcharge)

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS **										
	HORIZ. SPACING (FEET)	CROSS BRACES					VERT. SPACING (FEET)	WALES		MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)	UPRIGHTS
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15		SIZE (IN)	SPACING (FEET)			CLOSE
4	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 6	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
10	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 10	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
16	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 16	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
20	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 20	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
OVER 20	SEE NOTE 1										

* 14' x 12' oak or equivalent with a bending strength not less than 450 psi.
** All manufactured members of equivalent strength may be substituted for wood.

TABLE H-7

TIMBER TRENCH SHORING - MINIMUM TIMBER REQUIREMENTS *
SOIL TYPE A P₂ - 25 X 11 + 75 psf (1 ft. surcharge)

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS **										
	HORIZ. SPACING (FEET)	CROSS BRACES					VERT. SPACING (FEET)	WALES		MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)	UPRIGHTS
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15		SIZE (IN)	SPACING (FEET)			CLOSE
4	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 6	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
10	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 10	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
16	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 16	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
20	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 20	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
OVER 20	SEE NOTE 1										

* 14' x 12' oak or equivalent with a bending strength not less than 450 psi.
** All manufactured members of equivalent strength may be substituted for wood.

TABLE H-8

TIMBER TRENCH SHORING - MINIMUM TIMBER REQUIREMENTS *
SOIL TYPE B P₂ - 45 X 11 + 75 psf (1 ft. surcharge)

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS **										
	HORIZ. SPACING (FEET)	CROSS BRACES					VERT. SPACING (FEET)	WALES		MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)	UPRIGHTS
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15		SIZE (IN)	SPACING (FEET)			CLOSE
4	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 6	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
10	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 10	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
16	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 16	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
20	UP TO 4	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
	UP TO 20	4X4	4X4	4X4	4X4	4X4	4	4X10	3	3X6	
OVER 20	SEE NOTE 1										

* 14' x 12' oak or equivalent with a bending strength not less than 450 psi.
** All manufactured members of equivalent strength may be substituted for wood.

TABLE N-1
TIMBER SHEETING SYSTEMS - MINIMUM TENSILE DESIGN STRENGTHS
SOIL TYPE C, P, or S II or III (R. 5/19/92)

DEPTH OF TRENCH (FEET)	MODEL SPACING (FEET)	SIZE (SIZES) AND SPACING OF MEMBERS **										MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)
		CROSS BRACES					WALES					
		UP TO 4	UP TO 6	UP TO 8	UP TO 10	UP TO 12	SPACING (FEET)	SIZE (IN.)	SPACING (FEET)	SIZE (IN.)	SPACING (FEET)	
4	UP TO 4	6 X 6	6 X 6	6 X 6	6 X 6	3 X 8	5	8 X 8	5	3 X 6		
	UP TO 6	6 X 6	6 X 6	6 X 6	6 X 6	3 X 8	5	10 X 10	5	3 X 6		
	UP TO 8	6 X 6	6 X 6	6 X 6	6 X 6	3 X 8	5	10 X 12	5	3 X 6		
10	UP TO 6	6 X 8	6 X 8	6 X 8	6 X 8	3 X 8	5	10 X 10	5	4 X 6		
	UP TO 8	6 X 8	6 X 8	6 X 8	6 X 8	3 X 8	5	12 X 12	5	4 X 6		
	UP TO 10	6 X 8	6 X 8	6 X 8	6 X 8	3 X 8	5	12 X 12	5	4 X 6		
15	UP TO 6	6 X 8	6 X 8	6 X 8	6 X 8	3 X 8	5	10 X 10	5	4 X 6		
	UP TO 8	6 X 8	6 X 8	6 X 8	6 X 8	3 X 8	5	12 X 12	5	4 X 6		
	UP TO 10	6 X 8	6 X 8	6 X 8	6 X 8	3 X 8	5	12 X 12	5	4 X 6		
20	UP TO 6	6 X 8	6 X 8	6 X 8	6 X 8	3 X 8	5	10 X 10	5	4 X 6		
	UP TO 8	6 X 8	6 X 8	6 X 8	6 X 8	3 X 8	5	12 X 12	5	4 X 6		
	UP TO 10	6 X 8	6 X 8	6 X 8	6 X 8	3 X 8	5	12 X 12	5	4 X 6		
OVER 20	SEE NOTE 1											

* Designed for application with a bearing strength not less than 1500 psf.
** Manufactured members of equivalent strength may be substituted for wood.

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17]050 and [49.17]060, 92-22-067 (Order 92-06), § 296-155-66405, filed 10/30/92, effective 12/8/92.]

WAC 296-155-66407 Appendix D—Aluminum hydraulic shoring for trenches. (1) Scope. This appendix contains information that can be used when aluminum hydraulic shoring is provided as a method of protection against cave-ins in trenches that do not exceed 20 feet (6.1m) in depth. This appendix must be used when design of the aluminum hydraulic protective system cannot be performed in accordance with WAC 296-155-657 (3)(b).

(2) Soil Classification. In order to use data presented in this appendix, the soil type or types in which the excavation is made must first be determined using the soil classification method set forth in appendix A of this Part.

(3) Presentation of information. Information is presented in several forms as follows:

(a) Information is presented in tabular form in Tables N-8 through N-11. Each table presents the maximum vertical and horizontal spacings that may be used with various aluminum member sizes and various hydraulic cylinder sizes. Each table contains data only for the particular soil type in which the excavation or portion of the excavation is made. Tables N-8 and N-9 are for vertical shores in Types A and B soil. Tables N-10 and N-11 are for horizontal waler systems in Types B and C soil.

(b) Information concerning the basis of the tabular data and the limitations of the data is presented in subsection (4) of this appendix.

(c) Information explaining the use of the tabular data is presented in subsection (5) of this appendix.

(d) Information illustrating the use of the tabular data is presented in subsection (6) of this appendix.

(e) Miscellaneous notations (footnotes) regarding Table N-8 through N-11 are presented in subsection (7) of this appendix.

(f) Figures, illustrating typical installations of hydraulic shoring, are included just prior to the Tables. The illustrations page is entitled "Aluminum Hydraulic Shoring: Typical Installations."

(4) Basis and limitations of the data.

(a) Vertical shore rails and horizontal wales are those that meet the Section Modulus requirements in Tables N-8 through N-10. Aluminum material is 6061-T6 or material of equivalent strength and properties.

(b) Hydraulic cylinders specifications.

(i) 2-inch cylinders shall be a minimum 2-inch inside diameter with a minimum safe working capacity of no less than 18,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(ii) 3-inch cylinders shall be a minimum 3-inch inside diameter with a safe working capacity of not less than 30,000 pounds axial compressive load at extensions as recommended by product manufacturer.

(c) Limitation of application.

(i) It is not intended that the aluminum hydraulic specification apply to every situation that may be experienced in the field. These data were developed to apply to the situations that are most commonly experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this appendix must be otherwise designed as specified in WAC 296-155-657(3).

(ii) When any of the following conditions are present; the members specified in the Tables are not considered adequate. In this case, an alternative aluminum hydraulic shoring system or other type of protective system must be designed in accordance with WAC 296-155-657.

(A) When vertical loads imposed on cross braces exceed a 100 Pound gravity load distributed on a one foot section of the center of the hydraulic cylinder.

(B) When surcharge loads are present from equipment weighing in excess of 20,000 pounds.

(C) When only the lower portion of a trench is shored and the remaining portion of the trench is sloped or benched unless: The slope portion is sloped at an angle less steep than three horizontal to one vertical; or the members are selected from the tables for use at a depth which is determined from the top of the overall trench, and not from the toe of the sloped portion.

(5) Use of Tables N-8 through N-11. The members of the shoring system that are to be selected using this information are the hydraulic cylinders, and either the vertical shores or the horizontal wales. When a waler system is used the vertical timber sheeting to be used is also selected from these tables. The Tables N-8 and N-9 for vertical shores are used in Type A and B soils that do not require sheeting. Type B soils that may require sheeting, and Type C soils that always require sheeting are found in the horizontal wale Tables N-10 and N-11. The soil type must first be determined in accordance with the soil classification system described in appendix A of this Part. Using the appropriate table, the selection of the size and spacing of the members is made. The selection is based on the depth and width of the trench where the members are to be installed. In these tables the vertical spacing is held constant at four feet on center. The tables show the maximum horizontal spacing of cylinders allowed for each size of wale in the waler system tables, and in the vertical shore tables, the hydraulic cylinder horizontal spacing is the same as the vertical shore spacing.

(6) Example to Illustrate the Use of the Tables:

(a) Example 1: A trench dug in Type A soil is 6 feet deep and 3 feet wide. From Table N-8: Find vertical shores and 2 inch diameter cylinders spaced 8 feet on center (o.c.) horizontally and 4 feet on center (o.c.) vertically. (See Figures N-23 & N-25 for typical installations.)

(b) Example 2: A trench is dug in Type B soil that does not require sheeting, 13 feet deep and 5 feet wide. From Table N-9: Find vertical shores and 2 inch diameter cylinders spaced 6.5 feet o.c. horizontally and 4 feet o.c. vertically. (See Figures N-23 & N-25 for typical installations.)

(c) A trench is dug in Type B soil that does not require sheeting, but does experience some minor raveling of the trench face. The trench is 16 feet deep and 9 feet wide. From Table N-9: Find vertical shores and 2 inch diameter cylinder (with special oversleeves as designated by subdivision (7)(b)) spaced 5.5 feet o.c. horizontally and 4 feet o.c. vertically, plywood (per subdivision (7)(g) to the N-8 through N-11 Tables) should be used behind the shores. (See Figures N-24 & N-25 for typical installations.)

(d) Example 4: A trench is dug in previously disturbed Type B soil, with characteristics of a Type C soil, and will require sheeting. The trench is 18 feet deep and 12 feet wide. 8 foot horizontal spacing between cylinders is desired for working space. From Table N-10: Find horizontal wale with a section modulus of 14.0 spaced at 4 feet o.c. vertically and 3 inch diameter cylinder spaced at 9 feet maximum o.c. horizontally, 3x12 timber sheeting is required at close spacing vertically. (See Figure N-26 for typical installation.)

(e) Example 5: A trench is dug in Type C soil, 9 feet deep and 4 feet wide. Horizontal cylinder spacing in excess of 6 feet is desired for working space. From Table N-11: Find horizontal wale with a section modulus of 7.0 and 2 inch diameter cylinders spaced at 6.5 feet o.c. horizontally. Or, find horizontal wale with a 14.0 section modulus and 3 inch diameter cylinder spaced at 10 feet o.c. horizontally. Both wales are spaced 4 feet o.c. vertically. 3x12 timber sheeting is required at close spacing vertically. (See Figure N-26 for typical installation.)

(7) Footnotes, and general notes, for Tables N-8 through N-11.

(a) For applications other than those listed in the tables, refer to WAC 296-155-657 (3)(b) for use of manufacturer's tabulated data. For trench depths in excess of 20 feet, refer to WAC 296-155-657 (3)(b) and (c).

(b) 2-inch diameter cylinders, at this width, shall have structural steel tube (3.5x3.5x0.1875) oversleeves, or structural oversleeves of manufacturer's specification, extending the full, collapsed length.

(c) Hydraulic cylinders capacities.

(i) 2-inch cylinders shall be a minimum 2-inch inside diameter with a safe working capacity of not less than 18,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(ii) 3-inch cylinders shall be a minimum 3-inch inside diameter with a safe work capacity of not less than 30,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(d) All spacing indicated is measured center to center.

(1999 Ed.)

(e) Vertical shoring rails shall have a minimum section modulus of 0.40 inch.

(f) When vertical shores are used, there must be a minimum of three shores spaced equally, horizontally, in a group.

(g) Plywood shall be 1.125 in. thick softwood or 0.75 inch thick, 14 ply, arctic white birch (Finland form).

Please note that plywood is not intended as a structural member, but only for prevention of local raveling (sloughing of the trench face) between shores.

(h) See appendix C for timber specifications.

(i) Wales are calculated for simple span conditions.

(j) See subsection (4) of this appendix, for basis and limitations of the data.

ALUMINUM HYDRAULIC SHORING
TYPICAL INSTALLATIONS

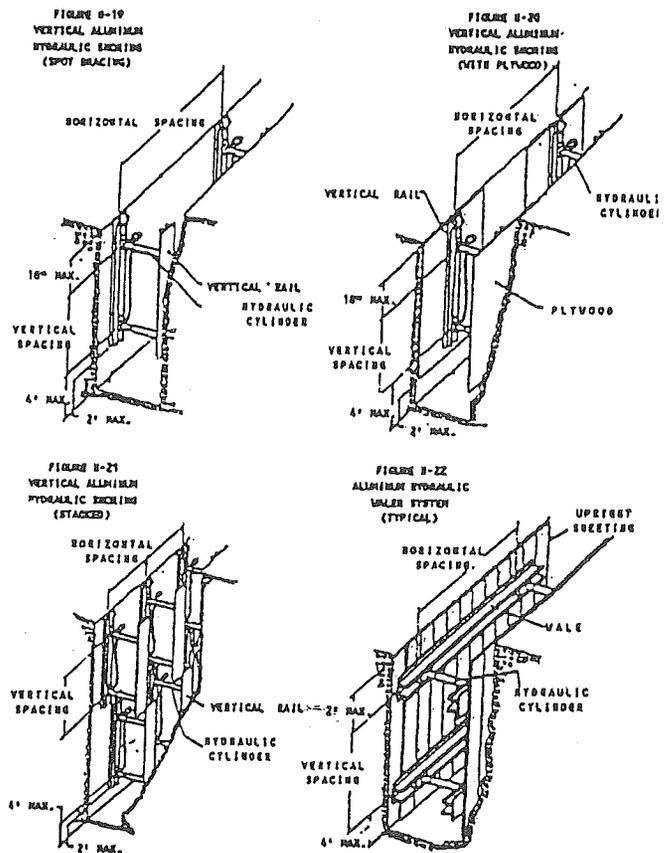


TABLE N-8
ALUMINUM HYDRAULIC SHORING
VERTICAL SHORES
FOR SOIL TYPE A

Depth of Trench (Feet)	Maximum Horizontal Spacing (Feet)	Maximum Vertical Spacing (Feet)	Hydraulic Cylinders		
			Width of Trench (Feet)		
			Up to 8	Over 8 Up to 12	Over 12 Up to 15
Over 4 Up to 10	8	4	2 INCH DIAMETER	2 INCH DIAMETER NOTE (2)	3 INCH DIAMETER
Over 10 Up to 15	8				
Over 15 Up to 20	7				
Over 20	NOTE (1)				

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, WAC 296-155-66407(7)
 Note (1): See Appendix D, WAC 296-155-66407(7)(a)
 Note (2): See Appendix D, WAC 296-155-66407(7)(b)

TABLE N-11
ALUMINUM HYDRAULIC SHORING
WALER SYSTEMS
FOR SOIL TYPE C

Depth of Trench (Feet)	Wales		Hydraulic Cylinders						Timber Uprights	
	Vertical Spacing (Feet)	Section Modulus (In ³)	Width of Trench (Feet)						Solid Sheet	2 Foot
			Up to 8		Over 8 Up to 12		Over 12 Up to 15			
			Waler Spacing	Cylinder Diameter	Waler Spacing	Cylinder Diameter	Waler Spacing	Cylinder Diameter		
Over 4 Up to 10	4	3.5	6.0	2 IN	6.0	2 IN	6.0	3 IN	3 X 12	—
			7.0	2 IN	6.5	2 IN	6.5	3 IN		
			14.0	3 IN	10.0	3 IN	10.0	3 IN		
Over 10 Up to 15	4	3.5	4.0	2 IN	4.0	2 IN	4.0	3 IN	3 X 12	—
			7.0	3 IN	5.5	3 IN	5.5	3 IN		
			14.0	3 IN	8.0	3 IN	8.0	3 IN		
Over 15 Up to 20	4	3.5	3.5	2 IN	3.5	2 IN	3.5	3 IN	3 X 12	—
			7.0	3 IN	5.0	3 IN	5.0	3 IN		
			14.0	3 IN	6.0	3 IN	6.0	3 IN		
Over 20	NOTE (1)									

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, WAC 296-155-66407(7)
 Note (1): See Appendix D, WAC 296-155-66407(7)(a)
 Note (2): See Appendix D, WAC 296-155-66407(7)(b)
 *Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

TABLE N-9
ALUMINUM HYDRAULIC SHORING
VERTICAL SHORES
FOR SOIL TYPE B

Depth of Trench (Feet)	Maximum Horizontal Spacing (Feet)	Maximum Vertical Spacing (Feet)	Hydraulic Cylinders		
			Width of Trench (Feet)		
			Up to 8	Over 8 Up to 12	Over 12 Up to 15
Over 4 Up to 10	8	4	2 INCH DIAMETER	2 INCH DIAMETER NOTE (2)	3 INCH DIAMETER
Over 10 Up to 15	6.5				
Over 15 Up to 20	5.5				
Over 20	NOTE (1)				

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, WAC 296-155-66407(7)
 Note (1): See Appendix D, WAC 296-155-66407(7)(a)
 Note (2): See Appendix D, WAC 296-155-66407(7)(b)

TABLE N-10
ALUMINUM HYDRAULIC SHORING
WALER SYSTEMS
FOR SOIL TYPE B

Depth of Trench (Feet)	Wales		Hydraulic Cylinders						Timber Uprights		
	Vertical Spacing (Feet)	Section Modulus (In ³)	Width of Trench (Feet)						Solid Sheet	2 Foot	3 Foot
			Up to 8		Over 8 Up to 12		Over 12 Up to 15				
			Waler Spacing	Cylinder Diameter	Waler Spacing	Cylinder Diameter	Waler Spacing	Cylinder Diameter			
Over 4 Up to 10	4	3.5	8.0	2 IN	8.0	2 IN	8.0	3 IN	—	—	3 X 12
			9.0	2 IN	9.0	2 IN	9.0	3 IN			
			14.0	3 IN	12.0	3 IN	12.0	3 IN			
Over 10 Up to 15	4	3.5	6.0	2 IN	6.0	2 IN	6.0	3 IN	—	3 X 12	—
			7.0	3 IN	8.0	3 IN	8.0	3 IN			
			14.0	3 IN	10.0	3 IN	10.0	3 IN			
Over 15 Up to 20	4	3.5	5.5	2 IN	5.5	2 IN	5.5	3 IN	3 X 12	—	—
			7.0	3 IN	6.0	3 IN	6.0	3 IN			
			14.0	3 IN	9.0	3 IN	9.0	3 IN			
Over 20	NOTE (1)										

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, WAC 296-155-66407(7)
 Note (1): See Appendix D, WAC 296-155-66407(7)(a)
 Note (2): See Appendix D, WAC 296-155-66407(7)(b)
 *Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17.050 and [49.17.060, 92-22-067 (Order 92-06), § 296-155-66407, filed 10/30/92, effective 12/8/92.]

WAC 296-155-66409 Appendix E—Alternatives to timber shoring.

Appendix E to part N - Alternatives to Timber Shoring

Figure N-23, Aluminum Hydraulic Shoring

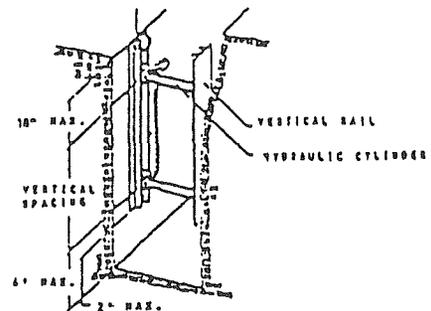


Figure N-24, Pneumatic/hydraulic Shoring

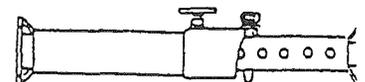
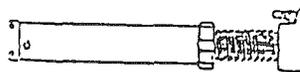


Figure N-25, Trench Jacks (Screw Jacks)

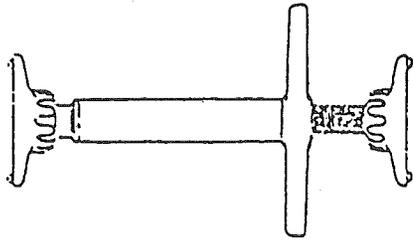
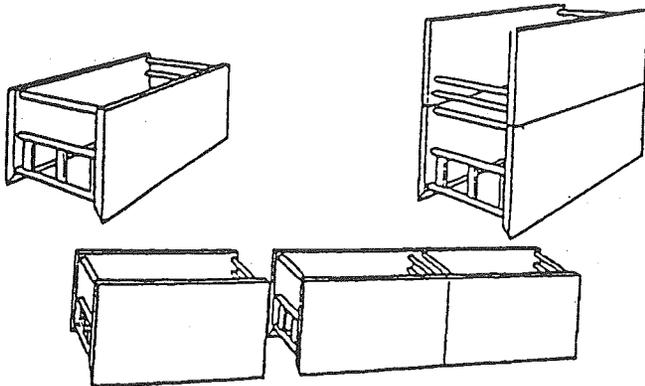


Figure N-26, Trench Shields



Appendix F to Part N - Selection of Protective Systems

The following figures are a graphic summary of the requirements contained in Part N for excavations 10 feet or less in depth. Protective systems for use in excavations more than 10 feet in depth must be designed by a registered professional engineer in accordance with WAC 296-155-657(2) and (3).

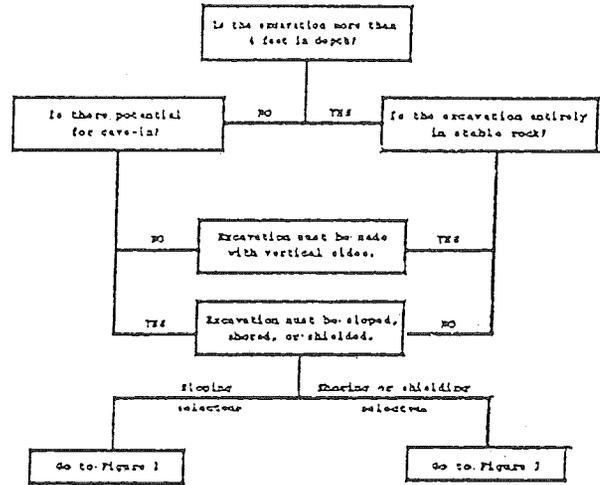


FIGURE N-27 - PRELIMINARY DECISIONS

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-66409, filed 10/30/92, effective 12/8/92.]

WAC 296-155-66411 Appendix F—Selection of protective systems. The following figures are a graphic summary of the requirements contained in Part N for excavations 20 feet or less in depth. Protective systems for use in excavations more than 20 feet in depth must be designed by a registered professional engineer in accordance with WAC 296-155-657 (2) and (3).

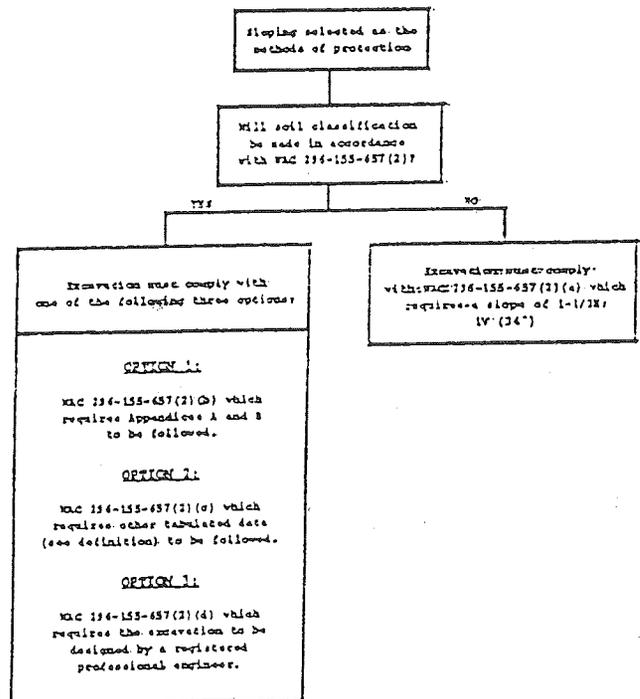


FIGURE N-28 - SLOPING OPTIONS

Shoring or shielding selected as the method of protection.

Soil classification is required when shoring or shielding is used. The excavation must comply with one of the following four options:

OPTION 1:

WAC 296-155-657(3)(a) which requires Appendices A and C to be followed (e.g., timber shoring)

OPTION 2:

WAC 296-155-657(3)(b) which requires manufacturers' data to be followed (e.g., hydraulic shoring, trench jacks, air shores, shields)

OPTION 3:

WAC 296-155-657(3)(c) which requires tabulated data (see definition) to be followed (e.g., any system as per the tabulated data).

OPTION 4:

WAC 296-155-657(3)(d) which requires the excavation to be designed by a registered professional engineer (e.g., any designed system).

FIGURE N-29 - SHORING AND SHIELDING OPTIONS

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060, 92-22-067 (Order 92-06), § 296-155-66411, filed 10/30/92, effective 12/8/92.]

**PART O
CONCRETE, CONCRETE FORMS, SHORING, AND
MASONRY CONSTRUCTION**

WAC 296-155-675 Scope, application, and definitions applicable to this part. (1) Scope and application. This part sets forth requirements to protect all construction employees from the hazards associated with concrete and masonry construction operations performed in workplaces covered under chapter 296-155 WAC.

(2) Definitions applicable to this part.

(a) "Bull float" means a tool used to spread out and smooth the concrete.

(b) "Formwork" means the total system of support for freshly placed or partially cured concrete, including the mold or sheeting (form) that is in contact with the concrete as well as all supporting members including shores, reshores, hardware, braces, and related hardware.

(c) "Jacking operation" means the task of lifting a slab (or group of slabs) vertically from one location to another

[Title 296 WAC—p. 2324]

(e.g., from the casting location to a temporary (parked) location, or from a temporary location to another temporary location, or to its final location in the structure), during the construction of a building/structure where the lift-slab process is being used.

(d) "Lift slab" means a method of concrete construction in which floor and roof slabs are cast on or at ground level and, using jacks, lifted into position.

(e) "Limited access zone" means an area alongside a masonry wall, which is under construction, and which is clearly demarcated to limit access by employees.

(f) "Precast concrete" means concrete members (such as walls, panels, slabs, columns, and beams) which have been formed, cast, and cured prior to final placement in a structure.

(g) "Reshoring" means the construction operation in which shoring equipment (also called reshores or reshoring equipment) is placed, as the original forms and shores are removed, in order to support partially cured concrete and construction loads.

(h) "Shore" means a supporting member that resists a compressive force imposed by a load.

(i) "Vertical slip forms" means forms which are jacked vertically during the placement of concrete.

(j) "Guy" means a line that steadies a high piece or structure by pulling against an off-center load.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-675, filed 7/20/94, effective 9/20/94; 91-11-070 (Order 91-01), § 296-155-675, filed 5/20/91, effective 6/20/91; 90-03-029 (Order 89-20), § 296-155-675, filed 1/11/90, effective 2/26/90; 89-11-035 (Order 89-03), § 296-155-675, filed 5/15/89, effective 6/30/89; Order 74-26, § 296-155-675, filed 5/7/74, effective 6/6/74.]

WAC 296-155-680 General provisions. (1) General. All equipment, material and construction techniques used in concrete construction and masonry work shall meet the applicable requirements for design, construction, inspection, testing, maintenance and operations as prescribed in ANSI A10.9-1970, Safety Requirements for Concrete Construction and Masonry Work.

(2) Construction loads. No construction loads shall be placed on a concrete structure or portion of a concrete structure unless the employer determines, based on information received from a person who is qualified in structural design, that the structure or portion of the structure is capable of supporting the loads.

(3) Vertical loads. Vertical loads consist of a dead load plus an allowance for live load. The weight of formwork together with the weight of freshly placed concrete is dead load. The live load consists of the weight of workers, equipment, runways and impact, and shall be computed in pounds per square foot (psf) of horizontal projection.

(4) Lateral loads. Braces and shores shall be designed to resist all foreseeable lateral loads such as wind, cable tensions, inclined supports, impact of placement, and starting and stopping of equipment. The assumed value of load due to wind, impact of concrete, and equipment acting in any direction at each floor line shall not be less than one hundred pounds per lineal foot of floor edge or two percent of total dead load of the floor, whichever is greater. Wall forms shall be designed for a minimum wind load of ten psf, and bracing for wall forms should be designed for a lateral load of at least

one hundred pounds per lineal foot of wall, applied at the top. Walls of unusual height require special consideration.

(5) Special loads. Formwork shall be designed for all special conditions of construction likely to occur, such as unsymmetrical placement of concrete, impact of machine-delivered concrete, uplift, and concentrated loads.

(6) Form supports and wedges shall be checked during concrete placement to prevent distortion or failure.

(7) Reinforcing steel.

(a) All protruding reinforcing steel, onto and into which employees could fall, shall be guarded to eliminate the hazard of impalement.

(b) Wire mesh rolls: Wire mesh rolls shall be secured at each end to prevent dangerous recoiling action.

(c) Guying: Reinforcing steel for walls, piers, columns, and similar vertical structures shall be guyed and supported to prevent overturning and to prevent collapse.

(8) Post-tensioning operations.

(a) No employee (except those essential to the post-tensioning operations) shall be permitted to be behind the jack during tensioning operations.

(b) Signs and barriers shall be erected to limit employee access to the post-tensioning area during tensioning operations.

(9) Working under loads.

(a) No employee shall be permitted to work under concrete buckets while buckets are being elevated or lowered into position.

(b) To the extent practical, elevated concrete buckets shall be routed so that no employee, or the fewest number of employees, are exposed to the hazards associated with falling concrete buckets.

(10) Personal protective equipment.

(a) No employee shall be permitted to apply a cement, sand, and water mixture through a pneumatic hose unless the employee is wearing protective head and face equipment.

(b) No employee shall be permitted to place or tie reinforcing steel more than six feet (1.8 m) above any adjacent working surface unless the employee is protected by the use of a safety belt or equivalent fall protection meeting the criteria of chapter 296-155 WAC, Part C-1.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-680, filed 7/20/94, effective 9/20/94; 90-17-051 (Order 90-10), § 296-155-680, filed 8/13/90, effective 9/24/90; 90-03-029 (Order 89-20), § 296-155-680, filed 1/11/90, effective 2/26/90; 89-11-035 (Order 89-03), § 296-155-680, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-680, filed 1/21/86; Order 74-26, § 296-155-680, filed 5/7/74, effective 6/6/74.]

WAC 296-155-681 Safe walking surfaces on concrete structural members. Structural members with studs, dowels, or shear connectors installed on the top side shall not be used as a walkway and/or means of access unless such studs, dowels, or shear connectors are covered with suitable material and in such a manner as to provide a walking surface at least as stable and free of hazards as the top surface of the member would provide without attachments installed.

Note: For the purpose of this section, "stud" means all protruding metal attachments to structural members.

[Statutory Authority: Chapter 49.17 RCW, 89-11-035 (Order 89-03), § 296-155-681, filed 5/15/89, effective 6/30/89.]

(1999 Ed.)

WAC 296-155-682 Requirements for equipment and tools. (1) Bulk cement storage. Bulk storage bins, containers, and silos shall be equipped with the following:

(a) Conical or tapered bottoms; and

(b) Mechanical or pneumatic means of starting the flow of material.

(2) No employee shall be permitted to enter storage facilities unless the ejection system has been shut down and locked out in accordance with WAC 296-155-429.

(3) Safety belts, harnesses, lanyards, lifelines or droplines, independently attached or attended, shall be used as prescribed in chapter 296-155 WAC, Part C-1.

(4) Concrete mixers. Concrete mixers with one cubic yard (.8 m³) or larger loading skips shall be equipped with the following:

(a) A mechanical device to clear the skip of materials; and

(b) Guardrails installed on each side of the skip.

(5) Power concrete trowels. Powered and rotating type concrete troweling machines that are manually guided shall be equipped with a control switch that will automatically shut off the power whenever the hands of the operator are removed from the equipment handles.

(6) Concrete buggies. Concrete buggy handles shall not extend beyond the wheels on either side of the buggy.

Note: Installation of knuckle guards on buggy handles is recommended.

(7) Runways.

(a) Runways shall be constructed to carry the maximum contemplated load with a safety factor of four, have a smooth running surface, and be of sufficient width for two buggies to pass. Single runs to have a minimum width of forty-two inches with turnouts. Runways to have standard railings. Where motor driven concrete buggies are used, a minimum four-inches by four-inches wheel guard shall be securely fastened to outside edge of runways.

(b) All concrete buggy runways which are 12 inches or more above a work surface or floor, or ramps with more than 4 percent incline shall be considered "elevated" runways.

Exception: Small jobs utilizing only one concrete buggy, or larger jobs utilizing a "one-way traffic pattern" may be exempt from the requirements for "turnouts" or for "sufficient width for two buggies to pass."

Exemption: Runways less than 12 inches above the floor or ground which are utilized by hard-powered buggies only, may be exempt from the requirements for guardrails and wheelguards.

(8) Concrete pumping systems.

(a) The employer shall comply with the manufacturer's specifications and limitations applicable to the operation of pumpcrete or similar systems. Where manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a qualified engineer, competent in this field, and such determinations will be appropriately documented and recorded.

(b) Rated load capacities, and recommended operating speeds and pressures, special hazard warnings, or instructions, shall be conspicuously posted on all equipment. Instructions and warnings shall be visible to the operator while at the control station.

[Title 296 WAC—p. 2325]

(c) Concrete pumping systems using discharge pipes shall be provided with pipe supports designed for one hundred percent overload.

(d) Compressed air hoses used on concrete pumping systems shall be provided with positive fail-safe joint connectors to prevent separation of sections when pressurized.

(e) No part of the concrete pumping system shall operate closer to high voltage electrical conductors than the distances specified in chapter 296-155 WAC, Part I.

(f) Hoses and/or pipes used to carry concrete under pressure shall be secured one to the other with an adequate length of at least 1/4 inch diameter chain or cable to prevent whipping in the event of an accidental separation of joints. All system safety pins shall be in place during pumping operations.

(g) The employer shall designate a competent person who shall inspect all machinery, equipment, and accessories prior to each use, and periodically during use, to make sure it is in safe operating conditions. Any deficiencies shall be repaired, or defective parts replaced before continued use.

(h) A thorough annual inspection of the equipment including nondestructive testing of all sections of the booms, by a method capable of ensuring the structural integrity of the material being tested shall be made. The inspection and testing shall be conducted by a competent person, or a government or private agency recognized by the department. A record of the test results shall be maintained by the employer, and a copy shall be available in each unit for inspection by the department.

(i) All welding shall conform to AWS B3.0-41 Standard Qualification Procedure: AWS D8.4-61 Recommended Practices of Automotive Welding Design: or AWS D10.9-69 Standard Qualification of Welding Procedures and Welders for Piping and Tubing.

(j) Booms shall not be used for operations other than that for which they are designed.

(9) Concrete buckets.

(a) Concrete buckets equipped with hydraulic or pneumatic gates shall have positive safety latches or similar safety devices installed to prevent premature or accidental dumping.

(b) Concrete buckets shall be designed to prevent concrete from hanging up on top and the sides.

(c) Riding of concrete buckets for any purpose shall be prohibited, and vibrator crews shall be kept out from under concrete buckets suspended from cranes or cableways.

(d) When discharging on a slope, the wheels of ready-mix trucks shall be blocked and the brakes set to prevent movement.

(10) Tremies. Sections of tremies and similar concrete conveyances shall be secured with wire rope (or equivalent materials in addition to the regular couplings or connections).

(11) Bull floats. Bull float handles, used where they might contact energized electrical conductors, shall be constructed of nonconductive material or insulated with a nonconductive sheath whose electrical and mechanical characteristics provide the equivalent protection of a handle constructed of nonconductive material.

(12) Masonry saws shall be constructed, guarded, and operated in accordance with WAC 296-155-367 (1) through (4).

(13) Lockout/tagout procedures. No employee shall be permitted to perform maintenance or repair activity on equipment (such as compressors, mixers, screens, or pumps used for concrete and masonry construction activities) where the inadvertent operation of the equipment could occur and cause injury, unless all potentially hazardous energy sources have been locked out and tagged in accordance with chapter 296-155 WAC, Part I.

[Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-682, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-682, filed 7/20/94, effective 9/20/94; 91-03-044 (Order 90-18), § 296-155-682, filed 1/10/91, effective 2/12/91; 90-17-051 (Order 90-10), § 296-155-682, filed 8/13/90, effective 9/24/90; 89-11-035 (Order 89-03), § 296-155-682, filed 5/15/89, effective 6/30/89.]

WAC 296-155-683 Concrete finishing. (1) Scaffolds for use of cement finishers shall comply with the requirements of chapter 296-155 WAC, Part J-1, Scaffolds.

(2) Where grinders, chippers, and other equipment is used which creates a thrust force while working on scaffolding, such scaffold shall be securely tied to a structure or held in with weighted drop lines.

(3) Grinding and dressing operations carried on within closed rooms, stairwells, elevator shafts, etc., shall be provided with forced air ventilation.

(4) Grinding machine operators shall wear respirators whenever machines are in operation or where dust hazard exists.

(5) Eye protection shall be worn by workers engaged in grinding, chipping, or sacking concrete as required by WAC 296-155-215.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-683, filed 2/13/98, effective 4/15/98. Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-683, filed 5/15/89, effective 6/30/89.]

WAC 296-155-684 Requirements for cast in place concrete. (1) General requirements for formwork.

(a) Formwork shall be designed, fabricated, erected, supported, braced, and maintained so that it will be capable of supporting without failure all vertical and lateral loads that may reasonably be anticipated to be applied to the formwork. Formwork which is designed, fabricated, erected, supported, braced, and maintained in conformance with the Appendix to this section will be deemed to meet the requirements of this subdivision.

(b) Any form, regardless of size, shall be planned in every particular and designed and constructed with an adequate factor of safety. In addition to computable loading, additional form pressures may result from impact during concrete placement, sudden lowering of temperatures retarding the set and increasing the liquid head or static pressure, vibrations of the form or concrete, uneven stressing resulting from failure or weakening of form members, or impact from concrete buckets or placing equipment. As a result, an adequate factor of safety is required to offset these unpredictable conditions.

(c) The thoroughness of planning and design shall be governed by the size, complexity, and intended use of the form. Formwork which is complex in nature or which will be subjected to unusually high concrete pressures shall be

designed or approved for use by an engineer or experienced form designer.

(2) Drawings or plans, including all revisions, for the jack layout, formwork (including shoring equipment), working decks, and scaffolds, shall be available at the jobsite.

(3) Shoring and reshoring.

(a) General: Shoring installations constructed in accordance with this standard shall be designed in accordance with American National Standard Recommended Practice for Concrete Formwork, ANSI-(ACI 347-78), Formwork for Concrete ACI 318-83, or with the following publications of the Scaffolding & Shoring Institute: Recommended Standard Safety Code for Vertical Shoring, 1970; Single Post Shore Safety Rules, 1969; and Steel Frame Shoring Safety, Safety Rules, 1969.

(b) All shoring equipment shall be inspected prior to erection to determine that it is as specified in the shoring layout.

(c) A shoring layout shall be prepared or approved by a person qualified to analyze the loadings and stresses which are induced during the construction process.

(d) A copy of the shoring layout shall be available at the jobsite.

(e) The shoring layout shall include all details of the specification, including unusual conditions such as heavy beams, sloping areas, ramps, and cantilevered slabs, as well as plan and elevation views.

(f) Shoring equipment found to be damaged such that its strength is reduced to less than that required by WAC 296-155-684 (1)(a) shall not be used for shoring.

(g) Erected shoring equipment shall be inspected immediately prior to, during, and immediately after concrete placement.

(h) Upon inspection, shoring equipment that is found to be damaged or weakened shall be immediately removed and replaced.

(i) The sills for shoring shall be sound, rigid, and capable of carrying the maximum intended load without settlement or displacement.

(j) All base plates, shore heads, extension devices, and adjustment screws shall be in firm contact, and secured when necessary, with the foundation and the form.

(k) Eccentric loads on shore heads and similar members shall be prohibited unless these members have been designed for such loading.

(l) The minimum total design load for any shoring used in slab and beam structures shall be not less than one hundred pounds per square foot for the combined live and dead load regardless of slab thickness; however, the minimum allowance for live load and formwork shall be not less than twenty pounds per square foot in addition to the weight of the concrete. Additional allowance for live load shall be added for special conditions other than when placing concrete for standard-type slabs and beams. Shoring shall also be designed to resist all foreseeable lateral loads such as wind, cable tensions, inclined supports, impact of placement, and starting and stopping of equipment. The assumed value of load due to wind, impact of concrete, and equipment acting in any direction at each floor line shall not be less than one hundred pounds per lineal foot of floor edge or two percent of total

dead load of the floor, whichever is greater. (See subsection (3)(b) of this section.)

(m) When motorized carts are used, the design load shall be increased twenty-five pounds per square foot.

(4) The design stresses for form lumber and timbers shall be within the tolerance of the grade, condition, and species of lumber used.

(5) The design stresses used for form lumber and timber shall be shown on all drawings, specifications, and shoring layouts.

(6) All load-carrying timber members of scaffold framing shall be a minimum of 1500 f (stress grade) construction grade lumber. All dimensions are nominal sizes except that where rough sizes are noted, only rough or undressed lumber of the size specified shall satisfy minimum requirements.

(7) When shoring from soil, an engineer or other qualified person shall determine that the soil is adequate to support the loads which are to be placed on it.

(8) Precautions shall be taken so that weather conditions do not change the load-carrying conditions of the soil below the design minimum.

(9) When shoring from fill or when excessive earth disturbance has occurred, an engineer or other qualified person shall supervise the compaction and reworking of the disturbed area and determine that it is capable of carrying the loads which are to be imposed upon it.

(10) Suitable sills shall be used on a pan or grid dome floor or any other floor system involving voids where vertical shoring equipment could concentrate an excessive load on a thin concrete section.

(11) When temporary storage of reinforcing rods, material, or equipment on top of formwork becomes necessary, these areas shall be sufficient to meet the loads.

(12) If any deviation in the shoring plan is necessary because of field conditions, the person who prepared the shoring layout shall be consulted for approval of the actual field setup before concrete is placed.

(13) The shoring setup shall be checked to insure that all details of the layout have been met.

(14) The completed shoring setup shall be a homogenous unit or units and shall have the specified bracing to give it lateral stability.

(15) The shoring setup shall be checked to make certain that bracing specified in the shoring layout for lateral stability is in place.

(16) All vertical shoring equipment shall be plumb. Maximum allowable deviation from the vertical is one-eighth inch in three feet. If this tolerance is exceeded, the shoring equipment shall not be used until readjusted within this limit.

(17) Upon inspection, shoring equipment that is found to be damaged or weakened shall be immediately removed and replaced.

(18) Shoring equipment shall not be released or removed until the approval of a qualified engineer has been received.

(19) Removal of shoring equipment shall be planned so that the equipment which is still in place is not overloaded.

(20) Slabs or beams which are to be reshored should be allowed to take their actual permanent deflection before final adjustment of reshoring equipment is made.

(21) While the reshoring is underway, no construction loads shall be permitted on the partially-cured concrete.

(22) The allowable load on the supporting slab shall not be exceeded when reshoring.

(23) The reshoring shall be thoroughly checked to determine that it is properly placed and that it has the load capacity to support the areas that are being reshored.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-684, filed 7/20/94, effective 9/20/94; 89-11-035 (Order 89-03), § 296-155-684, filed 5/15/89, effective 6/30/89.]

WAC 296-155-685 Tubular welded frame shoring.

(1) Metal tubular frames used for shoring shall have allowable loads based on tests conducted according to the Recommended Procedure for Compression Testing of Scaffolds and Shores, Scaffolding & Shoring Institute, 1967.

(2) Design of shoring layouts shall be based on allowable loads which were obtained using the test procedures of subsection (1) of this section and on at least a two and one-half to one safety factor.

(3) All metal frame shoring equipment shall be inspected before erection.

(4) Metal frame shoring equipment and accessories shall not be used if heavily rusted, bent, dented, rewelded, or having broken weldments or other defects.

(5) All locking devices on frames and braces shall be in good working order, coupling pins shall align the frame or panel legs, pivoted cross braces shall have their center pivot in place, and all components shall be in a condition similar to that of original manufacture.

(6) When checking the erected shoring frames with the shoring layout, the spacing between towers and cross-brace spacing shall not exceed that shown on the layout, and all locking devices shall be in the closed position.

(7) Devices for attaching the external lateral stability bracing shall be securely fastened to the legs of the shoring frames.

(8) All baseplates, shore heads, extension devices, or adjustment screws shall be in firm contact with the footing sill and the form material, and shall be snug against the legs of the frames.

(9) Eccentric loads on shore heads and similar members shall be prohibited unless the shore heads have been designed for such loading.

(10) When formwork is installed at an angle, or sloping, or when the surface shored from is sloping, the shoring shall be designed for such loading.

(11) Adjustment screws shall not be adjusted to raise formwork after the concrete is in place.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-685, filed 5/15/89, effective 6/30/89; Order 74-26, § 296-155-685, filed 5/7/74, effective 6/6/74.]

WAC 296-155-686 Tube and coupler shoring. (1)

Tube and coupler towers used for shoring shall have allowable loads based on tests conducted according to the Recommended Procedure for Compression Testing of Scaffolds and Shores, Scaffolding & Shoring Institute, 1967.

(2) Design of shoring layouts shall be based on working loads which were obtained using the test procedures of sub-

section (1) of this section and on at least a two and one-half to one safety factor.

(3) All tube and coupler components shall be inspected before being used.

(4) Tubes of shoring structures shall not be used if heavily rusted, bent, dented, or having other defects.

(5) Couplers (clamps) shall not be used if deformed, broken, or having defective or missing threads on bolts, or other defects.

(6) The material used for the couplers (clamps) shall be of a structural type such as drop-forged steel, malleable iron, or structural grade aluminum. Gray cast iron shall not be used.

(7) When checking the erected shoring towers with the shoring layout, the spacing between posts shall not exceed that shown on the layout, and all interlocking of tubular members and tightness of couplers should be checked.

(8) All baseplates, shore heads, extension devices, or adjustment screws shall be in firm contact with the footing sill and the form material, and shall be snug against the posts.

(9) Eccentric loads on shore heads and similar members shall be prohibited unless the shore heads have been designed for such loading.

(10) Special precautions shall be taken when formwork is at angles, or sloping, or when the surface shored from is sloping.

(11) Adjustment screws shall not be adjusted to raise formwork after the concrete is in place.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-686, filed 5/15/89, effective 6/30/89.]

WAC 296-155-687 Single post shores. (1) When checking erected single post shores with the shoring layout, the spacing between shores in either direction shall not exceed that shown on the layout, and all clamps, screws, pins, and all other components shall be in the closed or engaged position.

(2) For stability, single post shores shall be horizontally braced in both the longitudinal and transverse directions. Diagonal bracing shall also be installed. Such bracing shall be installed as the shores are being erected.

(3) Devices which attach to the external lateral stability bracing shall be securely fastened to the single post shores.

(4) All baseplates or shore heads of single post shores shall be in firm contact with the footing sill and the form material.

(5) Whenever single post shores are used in more than one tier, the layout shall be designed and inspected by a structural engineer.

(6) Eccentric loads on shore heads shall be prohibited unless the shore heads have been designed for such loading.

(7) When formwork is at an angle, or sloping, or when the surface shored from is sloping, the shoring shall be designed for such loading.

(8) Adjustment of single post shores to raise formwork shall not be made after concrete is in place.

(9) Respecting fabricated single post shores, the following shall apply:

(a) The clamp used for adjustable timber single post shores shall have working load ratings based on tests con-

ducted according to the standard test procedures for fabricated single post shores in Recommended Procedure for Compression Testing of Scaffolds and Shores, Scaffolding & Shoring Institute, 1967, and on at least a three to one safety factor.

(b) Shoring layouts shall be made using working loads which were obtained using the test procedures of (a) of this subsection, and on at least a three to one safety factor.

(c) All fabricated single post shores shall be inspected before being used.

(d) Fabricated single post shores shall not be used if heavily rusted, bent, dented, rewelded, or having broken weldments or other defects. If they contain timber, they shall not be used if timber is split, cut, has sections removed, is rotted, or otherwise structurally damaged.

(e) All clamps, screws, pins, threads, and all other components shall be in a condition similar to that of original manufacture.

(10) Respecting adjustable timber single post shores, the following shall apply:

(a) The clamp used for adjustable timber single post shores shall have working load ratings based on tests conducted according to the standard test procedures for fabricated single post shores in Recommended Procedure for Compression Testing of Scaffolds and Shores, Scaffolding & Shoring Institute, 1967, and on at least a three to one safety factor.

(b) Timber used shall have the safety factor and allowable working load for each grade and species as recommended in the Tables for wooden columns in the Wood Structural Design Data Book, National Forest Products Association, 1970.

(c) The shoring layout shall be made using the allowable load obtained by using the test procedure for the clamp or Tables for timber referred to in (a) and (b) of this subsection.

(d) All timber and adjusting devices to be used for adjustable timber single post shores shall be inspected before erection.

(e) Timber shall not be used if it is split, cut, has sections removed, is rotted, or is otherwise structurally damaged.

(f) Adjusting devices shall not be used if heavily rusted, bent, dented, rewelded, or having broken weldments or other defects.

(g) All nails used to secure bracing on adjustable timber single post shores shall be driven home and the point of the nail bent over.

(11) Respecting timber single post shores, the following shall apply:

(a) Timber used as single post shores shall have the safety factor and allowable working load for each grade and species as recommended in the Tables for wooden columns in the Wood Structural Design Data Book, National Forest Products Association, 1970.

(b) The shoring layout shall be prepared by using working loads obtained by using the Tables referred to in (a) of this subsection.

(c) All timber to be used for single post shoring shall be inspected before erection.

(d) Timber shall not be used if it is split, cut, has sections removed, is rotted, or is otherwise structurally damaged.

(e) All nails used to secure bracing on timber single post shores shall be driven home and the point of the nail bent over.

(12) Tiered single post shores. Whenever single post shores are used one on top of another (tiered), the employer shall comply with the following specific requirements in addition to the general requirements for formwork:

(a) The design of the shoring shall be prepared by a qualified designer and the erected shoring shall be inspected by an engineer qualified in structural design.

(b) The single post shores shall be vertically aligned.

(c) The single post shores shall be spliced to prevent misalignment.

(d) The single post shores shall be adequately braced in two mutually perpendicular directions at the splice level. Each tier shall also be diagonally braced in the same two directions.

(e) Adjustment of single post shores to raise formwork shall not be made after the placement of concrete.

(f) Reshoring shall be erected, as the original forms and shores are removed, whenever the concrete is required to support loads in excess of its capacity.

[Statutory Authority: Chapter 49.17 RCW, 89-11-035 (Order 89-03), § 296-155-687, filed 5/15/89, effective 6/30/89.]

WAC 296-155-688 Vertical slip forms. (1) Slip forms shall be designed and constructed, and the form movement carried out, under the immediate supervision of a person or persons experienced in slip form design and operation. Drawings prepared by a qualified engineer, showing the jack layout, formwork, working decks, and scaffolding, shall be available at the jobsite, and followed.

(2) The steel rods or pipe on which the jacks climb or by which the forms are lifted shall be designed for this purpose. Such rods must be adequately braced where not encased in concrete.

(3) Forms shall be designed to prevent excessive distortion of the structure during the jacking operation.

(4) All vertical slip forms shall be provided with scaffolding or work platforms completely encircling the area of placement.

(5) Jacks and vertical supports shall be positioned in such a manner that the loads do not exceed the rated capacity of the jacks.

(6) The jacks or other lifting devices shall be provided with mechanical dogs or other automatic holding devices to support the slip forms whenever failure of the power supply or lifting mechanism occurs.

(7) The form structure shall be maintained within all design tolerances specified for plumbness during the jacking operation.

(8) Lifting shall proceed steadily and uniformly and shall not exceed the predetermined safe rate of lift. A jacking system, which provides precise, simultaneous movement of the entire form in small preselected increments, is recommended for large structures.

(9) Workers placing reinforcing steel shall comply with the requirements of chapter 296-155 WAC, Part C-1 when working above the scaffold level.

(10) The total allowable load on slip form platforms shall be determined by the design engineer and enforced by the field supervisor.

(11) Lateral and diagonal bracing of the forms shall be provided to prevent excessive distortion of the structure during the sliding operation.

(12) While the slide is in operation, the form structure shall be maintained in line and plumb.

(13) A field supervisor experienced in slip form construction shall be present on the deck at all times.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-688, filed 2/13/98, effective 4/15/98. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-688, filed 1/10/91, effective 2/12/91; 89-11-035 (Order 89-03), § 296-155-688, filed 5/15/89, effective 6/30/89.]

WAC 296-155-689 Placing and removal of forms. (1)

When moved or raised by crane, cableway, A-frame, or similar mechanical device, forms shall be securely attached to slings having a minimum safety factor of five. Use of No. 9 tie wire, fiber rope, and similar makeshift lashing shall be prohibited.

(2) Taglines shall be used in moving panels or other large sections of forms by crane or hoist.

(3) All hoisting equipment, including hoisting cable used to raise and move forms shall have a minimum safety factor incorporated in the manufacturer's design, and the manufacturer's recommended loading shall not be exceeded. Field-fabricated or shop-fabricated hoisting equipment shall be designed or approved by a registered professional engineer, incorporating a minimum safety factor of five in its design. Panels and built-up form sections shall be equipped with metal hoisting brackets for attachment of slings.

(4) Forms intended for use where there is a free fall of over ten feet shall be equipped with adequate scaffolding and guardrails, or employees working on the forms shall be protected from falls in accordance with chapter 296-155 WAC, Part C-1 during forming and stripping operations.

(5) Vertical forms being raised or removed in sections shall not be released until adequately braced or secured. Overhead forms shall not be released until adequately braced or secured.

(6) Workers or others at lower levels shall be protected from falling materials. Appropriate warning signs shall be erected along walkways.

(7) Forms shall not be removed until the concrete is cured. The concrete shall be adequately set in order to permit safe removal of the forms, shoring, and bracing. Engineer's specifications and local building codes shall be adhered to in determining the length of time forms should remain in place following concrete placement. In addition, tests shall be made on field-cured concrete specimens in order to insure that concrete has obtained sufficient strength to safely support the load prior to removal of forms.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-689, filed 2/13/98, effective 4/15/98. Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-689, filed 1/10/91, effective 2/12/91; 89-11-035 (Order 89-03), § 296-155-689, filed 5/15/89, effective 6/30/89.]

WAC 296-155-690 Appendix to WAC 296-155-684 cast in place concrete. General requirements for formwork.

[Title 296 WAC—p. 2330]

(This Appendix is nonmandatory.)

This Appendix serves as a nonmandatory guideline to assist employers in complying with the formwork requirements in WAC 296-155-684 (1)(a). Formwork which has been designed, fabricated, erected, braced, supported, and maintained in accordance with Sections 6 and 7 of the American National Standard for Construction and Demolition Operations-Concrete and Masonry Work, ANSI A10.9-1983, shall be deemed to be in compliance with the provision of WAC 296-155-684 (1)(a).

[Statutory Authority: Chapter 49.17 RCW. 90-03-029 (Order 89-20), § 296-155-690, filed 1/11/90, effective 2/26/90; 89-11-035 (Order 89-03), § 296-155-690, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-690, filed 1/21/86; Order 74-26, § 296-155-690, filed 5/7/74, effective 6/6/74.]

WAC 296-155-691 Precast concrete and tilt-up operations. (1) It shall be the responsibility of the contractor to use accessories which are designed to be compatible.

(2) The design capacity of all lifting devices and accessories shall be known. The devices and accessories with the appropriate capacity shall be used.

(3) Prior to pouring the panels of a tilt-up type construction job, a set of plans or job specifications, including lifting procedures, shall be drawn up.

(a) These plans shall be at the job site and made available upon request.

(b) Any changes made in the rigging procedure of a tilt-up panel or slab shall provide the same degree of safety as required by the original plans.

(c) The plans or specifications shall contain the following information:

(i) The type, size, and location of all lifting inserts.

(ii) The type, size, and location of all brace inserts or fittings for guy wires in each panel and floor or support.

(iii) The size of braces or guys to be used.

(iv) The compression strength which concrete panels must attain prior to being lifted.

(4) The following conditions shall be included in the erection process and shall be incorporated in the design plan:

(a) Braces and all associated components of the bracing system shall be designed to incorporate a safety factor of one and one-half to resist any normal stresses to which they may be subjected, including normal high wind velocity pressures for the area.

(b) Precast concrete wall units, structural framing, and tilt-up wall panels shall be adequately supported to prevent overturning and to prevent collapse until permanent connections are completed.

(c) Floor braces used to secure panel sections shall be placed at an angle of not less than forty-five degrees or more than sixty degrees from horizontal when physically possible to install in this manner.

(d) The bracing on all panel sections shall be installed in such a manner as to prevent the panel from accidentally rotating.

(e) Each panel section not secured by other means shall have a minimum of two braces. The braces shall be installed in such a manner as to evenly distribute the load or guy wires, when properly installed, may be used in lieu of stiff leg braces.

(1999 Ed.)

(f) If braces are attached to a panel or slab by bolts tightened into inserts installed in holes drilled in concrete, the type of inserts used and method of installation shall be such as to develop the required strength to be maintained for the bracing system.

(g) Inserts to be installed for lifting sections of tilt-up precast panels shall be designed mechanically to maintain a safety factor of three.

(h) Lifting inserts which are embedded or otherwise attached to precast concrete members, other than the tilt-up members, shall be capable of supporting at least four times the maximum intended load applied or transmitted to them.

(i) The compression strength of the concrete shall be such that when the proper type, size, and amount of inserts are installed a minimum safety factor of two will be maintained.

(j) Lifting hardware shall be capable of supporting at least five times the maximum intended load applied or transmitted to the lifting hardware.

(k) Lifting bolts or other lifting devices which have been bent, worn, or are defective shall be discarded.

(l) The upper and lower sections of telescoping type braces shall be secured by high tensile steel pins or bolts which provide adequate shear strength and which will positively secure against accidental removal.

(m) Manufactured products shall not be altered in a manner which would reduce the safe working load to less than its original value.

(n) Inserts shall be positioned so that bolts, or lifting devices, when inserted, will be perpendicular to the face on which they are placed.

(5) Design of the panels and layout of the pour shall be made in such a manner so that when picking, the top of the panel will be away from the crane. If this is not possible, the contractor shall consult with a representative of the department and the crane company involved to determine the procedure to be followed in lifting and placing in its permanent position safely. Panels shall be lifted and handled in such a manner that they will not strike the hoisting equipment, in case of failure.

(a) Physical stops shall be provided which will prevent the bottom edge of a panel being set from slipping off the edge of its supporting structure.

(b) Tilt-up panels shall not be set when there is a possibility that wind velocity would create a hazardous condition.

(c) A qualified signalperson shall be designated and shall consult with the crane operator on lifting procedures prior to making the pick. The signalperson shall be located in such a position during the pick of the panel that they can observe both the crane operator and the employees working in the immediate area.

(d) During the lifting process, workers shall keep clear of the under side of the panel.

(e) Persons not involved in the lifting process shall be kept clear of the hazardous area near where panels are being raised, moved or placed.

(f) If braces must be removed temporarily during construction, other effective means shall be provided to safely support the panel during the interim period.

(g) Each panel shall be properly braced or otherwise secured prior to removal of the hoisting equipment.

(h) Short panels or sections not otherwise supported by floor, footings, columns or other structure, shall be properly shored.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-691, filed 7/20/94, effective 9/20/94; 90-17-051 (Order 90-10), § 296-155-691, filed 8/13/90, effective 9/24/90; 89-11-035 (Order 89-03), § 296-155-691, filed 5/15/89, effective 6/30/89.]

WAC 296-155-694 Requirements for lift-slab construction operations. (1) Lift-slab operations shall be designed and planned by a registered professional engineer who has experience in lift-slab construction. Such plans and designs shall be implemented by the employer and shall include detailed instructions and sketches indicating the prescribed method of erection. These plans and designs shall also include provisions for ensuring lateral stability of the building/structure during construction.

(2) Jacks/lifting units shall be marked to indicate their rated capacity as established by the manufacturer.

(3) Jacks/lifting units shall not be loaded beyond their rated capacity as established by the manufacturer.

(4) Jacking equipment shall be capable of supporting at least two and one-half times the load being lifted during jacking operations and the equipment shall not be overloaded. For the purpose of this provision, jacking equipment includes any load bearing component which is used to carry out the lifting operation(s). Such equipment includes, but is not limited to, the following: Threaded rods, lifting attachments, lifting nuts, hook-up collars, T-caps, shearheads, columns, and footings.

(5) Jacks/lifting units shall be designed and installed so that they will neither lift nor continue to lift when they are loaded in excess of their rated capacity.

(6) Jacks/lifting units shall have a safety device installed which will cause the jacks/lifting units to support the load in any position in the event any jack/lifting unit malfunctions or losses [loses] its lifting ability.

(7) Jacking operations shall be synchronized in such a manner to ensure even and uniform lifting of the slab. During lifting, all points at which the slab is supported shall be kept within 1/2 inch of that needed to maintain the slab in a level position.

(8) If leveling is automatically controlled, a device shall be installed that will stop the operation when the 1/2 inch tolerance set forth in subsection (7) of this section is exceeded or where there is a malfunction in the jacking (lifting) system.

(9) If leveling is maintained by manual controls, such controls shall be located in a central location and attended by a competent person while lifting is in progress. In addition to meeting the definition in WAC 296-155-012(4), the competent person must be experienced in the lifting operation and with the lifting equipment being used.

(10) The maximum number of manually controlled jacks/lifting units on one slab shall be limited to a number that will permit the operator to maintain the slab level within specified tolerances of subsection (7) of this section, but in no case shall that number exceed 14.

(11) No employee, except those essential to the jacking operation, shall be permitted in the building/structure while

any jacking operation is taking place unless the building/structure has been reinforced sufficiently to ensure its integrity during erection. The phrase "reinforced sufficiently to ensure its integrity" used in this subsection means that a registered professional engineer, independent of the engineer who designed and planned the lifting operation, has determined from the plans that if there is a loss of support at any jack location, that loss will be confined to that location and the structure as a whole will remain stable.

(a) Under no circumstances, shall any employee who is not essential to the jacking operation be permitted immediately beneath a slab while it is being lifted.

(b) For the purpose of subsection (11) of this section, a jacking operation begins when a slab or group of slabs is lifted and ends when such slabs are secured (with either temporary connections or permanent connections).

(c) Employers who comply with Appendix A to WAC 296-155-694 shall be considered to be in compliance with the provisions of subsections (11) through (11)(c) of this section.

(12) When making temporary connections to support slabs, wedges shall be secured by tack welding, or an equivalent method of securing the wedges to prevent them from falling out of position. Lifting rods may not be released until the wedges at that column have been secured.

(13) All welding on temporary and permanent connections shall be performed by a certified welder, familiar with the welding requirements specified in the plans and specifications for the lift-slab operation.

(14) Load transfer from jack/lifting units to building columns shall not be executed until the welds on the column shear plates (weld blocks) are cooled to air temperature.

(15) Jacks/lifting units shall be positively secured to building columns so that they do not become dislodged or dislocated.

(16) Equipment shall be designed and installed so that the lifting rods cannot slip out of position or the employer shall institute other measures, such as the use of locking or blocking devices, which will provide positive connection between the lifting rods and attachments and will prevent components from disengaging during lifting operations.

Appendix to WAC 296-155-694—Lift-slab operations
(This appendix is nonmandatory.)

In WAC 296-155-694(11), WISHA requires employees to be removed from the building/structure during jacking operations unless an independent registered professional engineer, other than the engineer who designed and planned the lifting operation, has determined that the building/structure has been sufficiently reinforced to insure the integrity of the building/structure. One method to comply with this provision is for the employer to ensure that continuous bottom steel is provided in every slab and in both directions through every wall or column head area. (Column head area means the distance between lines that are one and one half times the thickness of the slab or drop panel. These lines are located outside opposite faces of the outer edges of the shearhead sections—See Figure 1.) The amount of bottom steel shall be established by assuming loss of support at a given lifting jack and then determining the steel necessary to carry, by catenary action over the span between surrounding supports, the slab service dead load plus any service dead and

live loads likely to be acting on the slab during jacking. In addition, the surrounding supports must be capable of resisting any additional load transferred to them as a result of the loss of support at the lifting jack considered.

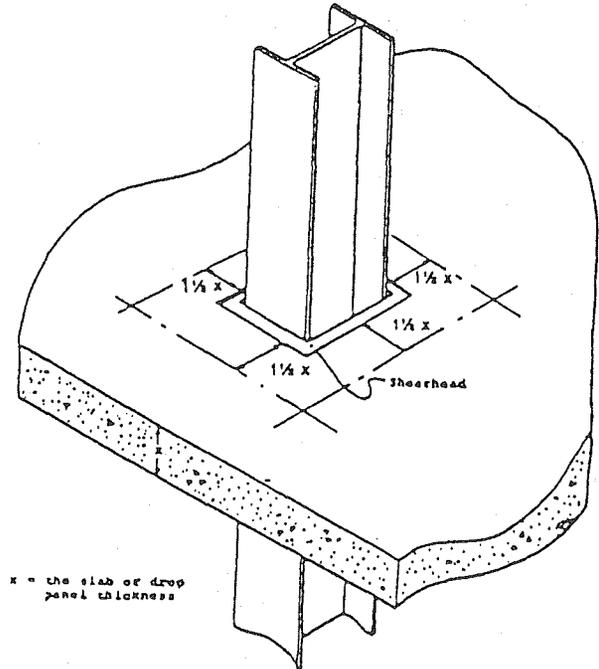


Figure 1—Column Head Area

[Statutory Authority: Chapter 49.17 RCW and RCW 49.17.040, [49.17].050 and [49.17].060. 92-22-067 (Order 92-06), § 296-155-694, filed 10/30/92, effective 12/8/92. Statutory Authority: Chapter 49.17 RCW. 91-11-070 (Order 91-01), § 296-155-694, filed 5/20/91, effective 6/20/91; 90-03-029 (Order 89-20), § 296-155-694, filed 1/11/90, effective 2/26/90; 89-11-035 (Order 89-03), § 296-155-694, filed 5/15/89, effective 6/30/89.]

WAC 296-155-695 Miscellaneous concrete construction. (1) General provisions.

(a) Deadheads used in post tensioning of tendons shall be the type that will increase the grip on the cable as the tension is increased.

(b) Proper means and equipment shall be used to prevent the over-tensioning of the tendons.

(c) Only qualified workers shall perform this type work.

(2) Prestressed and poststressed concrete operations.

(a) Anchor fitting. In utilizing anchor fittings for tensioned strands, the recommendations and instructions of the supplier concerning installation, maintenance, and replacement shall be followed.

(b) Tools and strand vices shall be kept clean and in good repair.

(c) Safety factor.

(i) Expendable strand deflection devices used to pretension concrete members shall have a minimum safety factor of two.

(ii) Reusable strand deflection devices shall have a minimum safety factor of three.

(d) Jacking operations.

(i) During jacking operations of any tensioning element or group of tensioning elements, the anchors shall be kept turned up close to the anchorplate.

(ii) No one shall be permitted to stand in line or directly over the jacking equipment during tensioning operations.

(iii) Employees shall not stand behind the jack during tensioning operations.

(e) Jacking and pulling equipment. Pulling headers, bolts, and hydraulic rams shall be frequently inspected for indication of fatigue, and the threads on bolts and nuts inspected for diminishing cross section.

(f) Storage. Stressed members shall be stored on a level base and adequately supported during storage and transportation to prevent tipping.

(g) Rigging.

(i) Stressed members shall be handled at pick points specifically designated on the manufacturer's drawings.

(ii) Stressed members shall be lifted with lifting devices recommended by the manufacturer or the engineer in charge.

(iii) No one shall be allowed under stressed members during lifting and erection.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-155-695, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-695, filed 1/21/86; Order 74-26, § 296-155-695, filed 5/7/74, effective 6/6/74.]

WAC 296-155-697 Requirements for masonry construction. (1) A limited access zone shall be established whenever a masonry wall is being constructed. The limited access zone shall conform to the following:

(2) The limited access zone shall be established prior to the start of construction of the wall.

(3) The limited access zone shall be equal to the height of the wall to be constructed plus four feet, and shall run the entire length of the wall.

(4) The limited access zone shall be established on the side of the wall which will be unscaffolded.

(5) The limited access zone shall be restricted to entry by employees actively engaged in constructing the wall. No other employees shall be permitted to enter the zone.

(6) The limited access zone shall remain in place until the wall is adequately supported to prevent overturning and to prevent collapse unless the height of wall is over eight feet, in which case, the limited access zone shall remain in place until the requirements of subsection (7) of this section have been met.

(7) All masonry walls over eight feet in height shall be adequately braced to prevent overturning and to prevent collapse unless the wall is adequately supported so that it will not overturn or collapse. The bracing shall remain in place until permanent supporting elements of the structure are in place.

(8) Employees engaged in cutting or chipping shall wear suitable eye protection in accordance with WAC 296-155-215.

(9) Masonry saws shall be constructed, guarded and operated in accordance with WAC 296-155-367 (1) through (4).

(10) Persons charged with operation of derricks used for stone setting shall be qualified in that type of work.

(11) Stone shall be set directly on the wall by the derrick.

(1999 Ed.)

(12) Breast derricks when used in setting stone shall be secured against a slip or kick back and guyed with wire cables. Provide hold down line to prevent derrick from falling back.

(13) Stone cutters shall wear goggles while trimming stone or cutting holes.

(14) Pins shall be tested for security before stone is hoisted.

(15) Hoisting cables shall be protected from chafing and wearing over corners.

(16) Mason's mortar mixers shall have a bar-type grill installed over the mixer opening. The guard shall be installed with an automatic disconnect switch to stop the mixer tub rotation and prevent the mixer from starting whenever the guard is not in place.

[Statutory Authority: Chapter 49.17 RCW. 90-17-051 (Order 90-10), § 296-155-697, filed 8/13/90, effective 9/24/90; 90-03-029 (Order 89-20), § 296-155-697, filed 1/11/90, effective 2/26/90; 89-11-035 (Order 89-03), § 296-155-697, filed 5/15/89, effective 6/30/89.]

WAC 296-155-699 Appendix A to Part O—References to Part O of chapter 296-155 WAC. (This Appendix is nonmandatory.)

The following nonmandatory references provide information which can be helpful in understanding and complying with the requirements contained in Part O.

- Accident Prevention Manual for Industrial Operations; Eighth Edition; National Safety Council.

- Building Code Requirements for Reinforced Concrete (ACI 318-83).

- Formwork for Concrete (ACI SP-4).

- Recommended Practice for Concrete Formwork (ACI 347-78).

- Safety Requirements for Concrete and Masonry Work (ANSI A10.9-1983).

- Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens (ASTM C39-86).

- Standard Test Method for Making and Curing Concrete Test Specimens in the Field (ASTM C31-85).

- Standard Test Method for Penetration Resistance of Hardened Concrete (ASTM C803-82).

- Standard Test Method for Compressive Strength of Concrete Cylinders Cast In-Place in Cylindrical Molds (ASTM C873-85).

- Standard Method for Developing Early Age Compressive Test Values and Projecting Later Age Strengths (ASTM C918-80).

- Recommended Practice for Inspection and Testing Agencies for Concrete, Steel and Bituminous Materials as Used in Construction (ASTM E329-77).

- Method of Making and Curing Concrete Test Specimens in the Laboratory (ASTM C192-88).

- Methods of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete (ASTM C42-87).

- Methods of Securing, Preparing and Testing Specimens from Hardened Lightweight Insulating Concrete for Compressive Strength (ASTM C513-86).

- Test Method for Comprehensive Strength of Lightweight Insulating Concrete (ASTM C495-86).

- Method of Making, Accelerating Curing, and Testing of Concrete Compression Test Specimens (ASTM C684-81).

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• Test Method for Compressive Strength of Concrete Using Portions of Beams Broken in Flexure (ASTM C116-68 (1980)).

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-699, filed 7/20/94, effective 9/20/94; 89-11-035 (Order 89-03), § 296-155-699, filed 5/15/89, effective 6/30/89.]

PART P STEEL ERECTION

WAC 296-155-700 General requirements. (1) Erection gangs on structural steel erection shall work under the direction of experienced crew leader.

(2) Workers shall not ride on steel being hoisted, nor slide down ropes, columns or ladders.

(3) Wire rope slings shall be used when lifting loads. Care shall be taken to avoid sharp bends by using wood or similar type padding between wire rope and load. Reinforcing steel shall not be lifted by bundling ties.

(4) If float scaffolds are used during steel erection, they shall be used in accordance with WAC 296-155-484(19).

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-700, filed 2/13/98, effective 4/15/98. Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-700, filed 7/20/94, effective 9/20/94; 91-03-044 (Order 90-18), § 296-155-700, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-700, filed 1/21/86; Order 76-29, § 296-155-700, filed 9/30/76; Order 74-26, § 296-155-700, filed 5/7/74, effective 6/6/74.]

WAC 296-155-705 Flooring requirements. (1) Permanent flooring—Skeleton steel construction in tiered buildings.

(a) The permanent floors shall be installed as the erection of structural members progresses, and there shall be not more than eight stories between the erection floor and the uppermost permanent floor, except where the structural integrity is maintained as a result of the design.

(b) At no time shall there be more than four floors or 48 feet of unfinished bolting or welding above the foundation or uppermost permanently secured floor.

(2) Temporary flooring—Skeleton steel construction in tiered buildings.

(a)(i) The derrick or erection floor shall be solidly planked or decked over its entire surface except for access openings. Planking or decking of equivalent strength, shall be of proper thickness to carry the working load. Planking shall be not less than 2 inches thick full size undressed, and shall be laid tight and secured to prevent movement.

(ii) On buildings or structures not adaptable to temporary floors, and where scaffolds are not used, safety nets shall be installed and maintained whenever the potential fall distance exceeds 10 feet. The nets shall be hung with sufficient clearance to prevent contacts with the surface of structures below.

(iii) Floor periphery - safety railing. A standard railing including midrail of 1/2-inch wire rope or equivalent shall be installed at the periphery (including all floor openings) of all temporary-planked or temporary metal-decked floors of tier buildings and other multifloored structures during structural steel assembly.

(b)(i) Where skeleton steel erection is being done, a tightly planked and substantial floor shall be maintained

within two stories or twenty-five feet, whichever is less, below and directly under that portion of each tier of beams on which any work is being performed, except when gathering and stacking temporary floor planks on a lower floor, in preparation for transferring such planks for use on an upper floor. Where such a floor is not practicable, subsection (2)(a)(ii) of this section applies.

(ii) When gathering and stacking temporary floor planks, the planks shall be removed successively, working toward the last panel of the temporary floor so that the work is always done from the planked floor.

(3) Flooring - other construction.

(a) In the erection of a building having double wood floor construction, the rough flooring shall be completed as the building progresses, including the tier below the one on which floor joists are being installed.

(b) For single wood floor or other flooring systems, the floor immediately below the story where the floor joists are being installed shall be kept planked or decked over.

[Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-705, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-705, filed 1/21/86; Order 76-29, § 296-155-705, filed 9/30/76; Order 74-26, § 296-155-705, filed 5/7/74, effective 6/6/74.]

WAC 296-155-710 Structural steel assembly. (1) During the final placing of solid web structural members, the load shall not be released from the hoisting line until the members are secured with not less than two bolts, or the equivalent at each connection and drawn up wrench tight.

(2) Open web steel joists shall not be placed on any structural steel framework unless such framework is safely bolted or welded.

(3)(a) In steel framing, where bar joists are utilized, and columns are not framed in at least two directions with structural steel members, a bar joist shall be field-bolted at columns to provide lateral stability during construction.

(b) Where longspan joists or trusses, 40 feet or longer, are used, a center row of bolted bridging shall be installed to provide lateral stability during construction prior to slacking of hoisting line.

(c) No load shall be placed on open web steel joists until these security requirements are met.

(4) Tag lines shall be used for controlling loads.

[Order 74-26, § 296-155-710, filed 5/7/74, effective 6/6/74.]

WAC 296-155-715 Bolting, riveting, fitting-up, and plumbing-up. (1) General requirements.

(a) Containers shall be provided for storing or carrying rivets, bolts, and drift pins, and secured against accidental displacement when aloft.

(b) Pneumatic hand tools shall be disconnected from the power source, and pressure in hose lines shall be released, before any adjustments or repairs are made.

(c) Air line hose sections shall be tied together except when quick disconnect couplers are used to join sections.

(d) Eye protection shall be provided in accordance with Part C of this chapter.

(2) Bolting.

(a) When bolts or drift pins are being knocked out, means shall be provided to keep them from falling.

(b) Impact wrenches shall be provided with a locking device for retaining the socket.

(3) Riveting.

(a) Riveting shall not be done in the vicinity of combustible material unless precautions are taken to prevent fire.

(b) When workers are below and rivet heads are knocked off or backed out, means shall be provided to keep the rivet heads from falling on such workers.

(c) A safety wire shall be properly installed on the snap and on the handle of the pneumatic riveting hammer and shall be used at all times. The wire size shall be not less than No. 9 (B & S gauge), leaving the handle and annealed No. 14 on the snap or equivalent.

(d) The rivet heating equipment shall be kept as near as possible to the riveting gang with whom the rivet heater is working.

(e) Hot rivets shall never be thrown across shaftways or towards the outside of a building.

(f) When riveting is done on an outside wall, the rivets shall be passed by hand or thrown parallel to the wall.

(g) Metal cone shaped buckets shall be used for catching hot rivets.

(h) Riveters shall avoid allowing the air hose to become wrapped or tangled around their legs.

(i) Empty bolt and rivet kegs shall be removed from the floor as soon as possible.

(j) Pails and hand lines shall be used when raising or lowering bolts, rivets or small tools.

(k) The nozzle of the riveting gun shall be periodically inspected and the wire attachment not allowed to become worn so as to permit the nozzle to fly out with the air pressure.

(l) Electric welding equipment shall not be used where wire rope is used to suspend scaffolds.

(4) Plumbing-up.

(a) Connections of the equipment used in plumbing-up shall be properly secured.

(b) The turnbuckles shall be secured to prevent unwinding while under stress.

(c) Plumbing-up guys related equipment shall be placed so that employees can get at the connection points.

(d) Plumbing-up guys shall be removed only under the supervision of a competent person.

(5) Wood planking shall be of proper thickness to carry the working load, but shall be not less than 2 inches thick full size undressed, exterior grade plywood, at least 3/4-inch thick, or equivalent material.

(6) Metal decking of sufficient strength shall be laid tight and secured to prevent movement.

(7) Planks shall overlap the bearing on each end by a minimum of 12 inches.

(8) Wire mesh, exterior plywood, or equivalent, shall be used around columns where planks do not fit tightly.

(9) Provisions shall be made to secure temporary flooring against displacement.

(10) All unused openings in floors, temporary or permanent, shall be completely planked over or guarded in accordance with Part K of this chapter.

(11) Temporary bracing and/or guying shall be utilized to stabilize a structure until construction has been completed.

(12) Employees shall use safety belts in accordance with Part C-1 of this chapter when they are working on float scaffolds.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-715, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-715, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-715, filed 7/20/94, effective 9/20/94; Order 76-29, § 296-155-715, filed 9/30/76; Order 74-26, § 296-155-715, filed 5/7/74, effective 6/6/74.]

WAC 296-155-720 Safe walking surfaces on structural members. Structural members with studs, dowels or shear connectors installed on the top side shall not be used as a walkway and/or means of access unless such studs, dowels or shear connectors are covered with suitable material and in such a manner as to provide a walking surface at least as stable and free of hazards as the top surface of the member would provide without attachments installed. For the purpose of this section, "stud," shall mean all protruding metal attachments to structural members.

[Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-720, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-720, filed 1/21/86; Order 74-26, § 296-155-720, filed 5/7/74, effective 6/6/74.]

PART Q

UNDERGROUND CONSTRUCTION

WAC 296-155-725 Definitions applicable to this part.

(1) "Acceptable" means any device, equipment, or appliance that is either approved by MSHA and maintained in permissible condition, or is listed or labeled for the class and location under Part I of this chapter.

(2) "Bulkhead" means an airtight structure separating the working chamber from free air or from another chamber under a lesser pressure than the working pressure.

(3) "Caisson" means a wood, steel, concrete or reinforced concrete, air- and water-tight chamber in which it is possible for persons to work under air pressure greater than atmospheric pressure to excavate material below water level.

(4) "Cofferdam" means a watertight barricade or enclosure erected, sunk, driven or otherwise fabricated to permit the performance of work where hydrostatic pressure exists.

(5) "Decanting" means a method used for decompressing under emergency circumstances. In this procedure, the employees are brought to atmospheric pressure with a very high gas tension in the tissues and then immediately recompressed in a second and separate chamber or lock.

(6) "Emergency locks" means a lock designed to hold and permit the quick passage of an entire shift of employees.

(7) "High air" means air pressure used to supply power to pneumatic tools and devices.

(8) "Low air" means air supplied to pressurize working chambers and locks.

(9) "Man lock" means a chamber through which persons pass from one air pressure environment into another.

(10) "Materials lock" means a chamber through which materials and equipment pass from one air pressure environment into another.

(11) "Medical lock" means a special chamber in which employees are treated for decompression illness. It may also be used in pre-employment physical examinations to deter-

mine the adaptability of the prospective employee to changes in pressure.

(12) "Rapid excavation machine" means tunnel boring machines, shields, roadheaders, or any other similar excavation machine.

(13) "Normal condition" means one during which exposure to compressed air is limited to a single continuous working period followed by a single decompression in any given 24-hour period; the total time of exposure to compressed air during the single continuous working period is not interrupted by exposure to normal atmospheric pressure, and a second exposure to compressed air does not occur until at least 12 consecutive hours of exposure to normal atmospheric pressure has elapsed since the employee has been under pressure.

(14) "Pressure" means a force acting on a unit area. Usually shown as pounds per square inch. (p.s.i.)

(15) "Absolute pressure" (p.s.i.a.) means the sum of the atmospheric pressure and gauge pressure (p.s.i.g.)

(16) "Atmospheric pressure" means the pressure of air at sea level, usually 14.7 p.s.i.a. (1 atmosphere), or 0 p.s.i.g.

(17) "Gauge pressure" (p.s.i.g.) means pressure measured by a gauge and indicating the pressure exceeding atmospheric.

(18) "Safety screen" means an air- and water-tight diaphragm placed across the upper part of a compressed air tunnel between the face and bulkhead, in order to prevent flooding the crown of the tunnel between the safety screen and the bulkhead, thus providing a safe means of refuge and exit from a flooding or flooded tunnel.

(19) "Special decompression chamber" means a chamber to provide greater comfort for employees when the total decompression time exceeds 75 minutes.

(20) "Working chamber" means the space or compartment under air pressure in which the work is being done.

(21) "C.F.R." means Code of Federal Regulations.

(22) "MSHA" means Mine Safety and Health Administration.

(23) "NIOSH" means National Institute for Occupational Safety and Health.

[Statutory Authority: Chapter 49.17 RCW. 90-03-029 (Order 89-20), § 296-155-725, filed 1/11/90, effective 2/26/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-725, filed 1/21/86; Order 74-26, § 296-155-725, filed 5/7/74, effective 6/6/74.]

WAC 296-155-730 Tunnels and shafts. (1) Scope and application.

(a) This section applies to the construction of underground tunnels, shafts, chambers, and passageways. This section also applies to cut-and-cover excavations which are both physically connected to ongoing underground construction operations within the scope of this section, and covered in such a manner as to create conditions characteristic of underground construction.

(b) This section does not apply to excavation and trenching operations covered by Part N of this chapter, such as foundation operations for above-ground structures that are not physically connected to underground construction operations, and surface excavation.

(c) The employer shall comply with the requirements of this part and chapter in addition to applicable requirements of

chapter 296-36 WAC, Safety standards—Compressed air work.

(2) Access and egress.

(a) Each operation shall have a check-in/check-out system that will provide positive identification of every employee underground. An accurate record of identification and location of the employees shall be kept on the surface. This procedure is not required when the construction of underground facilities designed for human occupancy has been sufficiently completed so that the permanent environmental controls are effective, and when the remaining construction activity will not cause any environmental hazard, or structural failure within the facilities.

(b) The employer shall provide and maintain safe means of access and egress to all work stations.

(c) The employer shall provide access and egress in such a manner that employees are protected from being struck by excavators, haulage machines, trains, and other mobile equipment.

(d) The employer shall control access to all openings to prevent unauthorized entry underground. Unused chutes, manways, or other openings shall be tightly covered, bulkheaded, or fenced off, and shall be posted with warning signs indicating "keep out" or similar language. Completed or unused sections of the underground facility shall be barricaded.

(3) Safety instruction. All employees shall be instructed in the recognition and avoidance of hazards associated with underground construction activities including, where appropriate, the following subjects:

(a) Air monitoring;

(b) Ventilation;

(c) Confined space entry procedures;

(d) Permit-required confined space entry procedures;

(e) Illumination;

(f) Communications;

(g) Flood control;

(h) Mechanical equipment;

(i) Personal protective equipment;

(j) Explosives;

(k) Fire prevention and protection; and

(l) Emergency procedures, including evacuation plans and check-in/check-out systems.

(4) Notification.

(a) Oncoming shifts shall be informed of any hazardous occurrences or conditions that have affected, or might affect employee safety, including liberation of gas, equipment failures, earth or rock slides, cave-ins, floodings, fire(s), or explosions.

(b) Information specified in (a) of this subsection shall be recorded in a shift journal which shall be current prior to the end of each shift, and shall be located aboveground.

(c) Oncoming supervisory personnel shall read the notification prior to going underground, and shall signify their understanding of the contents by affixing their respective initials to the log.

(d) The hazard notification log shall be retained on the site until the completion of the project.

(e) The employer shall establish and maintain direct communications for coordination of activities with other

employers whose operations at the jobsite affect or may affect the safety of employees underground.

(5) Communications.

(a) When natural unassisted voice communication is ineffective, a power-assisted means of voice communication shall be used to provide communication between the work face, the bottom of the shaft, and the surface.

(b) Two effective means of communication, at least one of which shall be voice communication, shall be provided in all shafts which are being developed or used either for personnel access or for hoisting. Additional requirements for hoist operator communication are contained in subsection (22)(c)(xv) of this section.

(c) Powered communication systems shall operate on an independent power supply, and shall be installed so that the use of or disruption of any one phone or signal location will not disrupt the operation of the system from any other location.

(d) Communication systems shall be tested upon initial entry of each shift to the underground, and as often as necessary at later times, to ensure that they are in working order.

(e) Any employee working alone underground in a hazardous location, who is both out of the range of natural unassisted voice communication and not under observation by other persons, shall be provided with an effective means of obtaining assistance in an emergency.

(6) Emergency provisions. Hoisting capability. When a shaft is used as a means of egress, the employer shall make advance arrangements for power-assisted hoisting capability to be readily available in an emergency, unless the regular hoisting means can continue to function in the event of an electrical power failure at the jobsite. Such hoisting means shall be designed so that the load hoist drum is powered in both directions of rotation and so that the brake is automatically applied upon power release or failure.

(7) Self-rescuers. The employer shall provide self-rescuers having current approval from the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration to be immediately available to all employees at work stations in underground areas where employees might be trapped by smoke or gas. The selection, issuance, use, and care of respirators shall be in accordance with the requirements of chapter 296-62 WAC, Part E.

(8) Designated person. At least one designated person shall be on duty aboveground whenever any employee is working underground. This designated person shall be responsible for securing immediate aid and keeping an accurate record of the number, identification, and location of employees who are underground in case of emergency. The designated person must not be so busy with other responsibilities that the personnel counting and identification function is encumbered.

(9) Emergency lighting. Each employee underground shall have an acceptable portable hand lamp or cap lamp in his or her work area for emergency use, unless natural light or an emergency lighting system provides adequate illumination for escape.

(10) Rescue teams.

(a) On jobsites where 25 or more employees work underground at one time, the employer shall provide (or make

arrangements in advance with locally available rescue services to provide) at least two 5-person rescue teams, one on the jobsite or within one-half hour travel time from the entry point, and the other within 2 hours travel time.

(b) On jobsites where less than 25 employees work underground at one time, the employer shall provide (or make arrangements in advance with locally available rescue services to provide) at least one 5-person rescue team to be either on the jobsite or within one-half hour travel time from the entry point.

(c) Rescue team members shall be qualified in rescue procedures, the use and limitations of breathing apparatus, and the use of fire fighting equipment. Qualifications shall be reviewed not less than annually.

(d) On jobsites where flammable or noxious gases are encountered or anticipated in hazardous quantities, rescue team members shall practice donning and using pressure demand mode, self-contained breathing apparatuses monthly.

(e) The employer shall ensure that rescue teams are familiar with conditions at the jobsite.

(11) Hazardous classifications.

(a) Potentially gassy operations. Underground construction operations shall be classified as potentially gassy if either:

(i) Air monitoring discloses 10 percent or more of the lower explosive limit for methane or other flammable gases measured at 12 inches (304.8 mm) +/- 0.25 inch (6.35 mm) from the roof, face, floor, or walls in any underground work area for more than a 24-hour period; or

(ii) The history of the geographical area or geological formation indicates that 10 percent or more of the lower explosive limit for methane or other flammable gases is likely to be encountered in such underground operations.

(b) Gassy operations. Underground construction operations shall be classified as gassy if:

(i) Air monitoring discloses 10 percent or more of the lower explosive limit for methane or other flammable gases measured at 12 inches (304.8 mm) +/- 0.25 inch (6.35 mm) from the roof, face, floor, or walls in any underground work area for three consecutive days; or

(ii) There has been an ignition of methane or of other flammable gases emanating from the strata that indicates the presence of such gases; or

(iii) The underground construction operation is both connected to an underground work area which is currently classified as gassy and is also subject to a continuous course of air containing the flammable gas concentration.

(c) Declassification to potentially gassy operations. Underground construction gassy operations may be declassified to potentially gassy when air monitoring results remain under 10 percent of the lower explosive limit for methane or other flammable gases for three consecutive days.

(12) Gassy operations—Additional requirements. Only acceptable equipment, maintained in suitable condition, shall be used in gassy operations.

(a) Mobile diesel-powered equipment used in gassy operations shall be either approved in accordance with the requirements of 30 CFR Part 36 (formerly Schedule 31) by MSHA, or shall be demonstrated by the employer to be fully

equivalent to such MSHA-approved equipment, and shall be operated in accordance with that part.

(b) Each entrance to a gassy operation shall be prominently posted with signs notifying all entrants of the gassy classification.

(c) Smoking shall be prohibited in all gassy operations and the employer shall be responsible for collecting all personal sources of ignition, such as matches and lighters, from all persons entering a gassy operation.

(d) A fire watch as described in chapter 296-155 WAC, Part H, shall be maintained when hot work is performed.

(e) Once an operation has met the criteria in subsection (11)(a)(i) of this section, warranting classification as gassy, all operations in the affected area, except the following, shall be discontinued until the operation either is in compliance with all of the gassy operation requirements or has been declassified in accordance with (c) of this subsection:

(i) Operations related to the control of the gas concentration;

(ii) Installation of new equipment, or conversion of existing equipment, to comply with this subsection; and

(iii) Installation of above-ground controls for reversing the air flow.

(13) Air quality and monitoring.

(a) General. Air quality limits and control requirements specified in chapter 296-62 WAC, Part H, shall apply except as modified by this subsection.

(b) The employer shall assign a competent person who shall perform all air monitoring required by this section.

(c) Where this section requires monitoring of airborne contaminants "as often as necessary," the competent person shall make a reasonable determination as to which substances to monitor and how frequently to monitor, considering at least the following factors:

(i) Location of jobsite: Proximity to fuel tanks, sewers, gas lines, old landfills, coal deposits, and swamps;

(ii) Geology: Geological studies of the jobsite, particularly involving the soil type and its permeability;

(iii) History: Presence of air contaminants in nearby jobsites, changes in levels of substances monitored on the prior shift; and

(iv) Work practices and jobsite conditions: The use of diesel engines, use of explosives, use of fuel gas, volume and flow of ventilation, visible atmospheric conditions, decomposition of the atmosphere, welding, cutting and hot work, and employees' physical reactions to working underground.

(d) The employer shall provide testing and monitoring instruments which are capable of achieving compliance with the provisions of this subsection, and:

(i) Shall maintain the testing and monitoring instruments in good condition;

(ii) Shall calibrate the instruments on a frequency not to exceed 6 months.

(e) Exposure to airborne contaminants shall not exceed the levels established by chapter 296-62 WAC, Part H.

(f) Respirators shall not be substituted for environmental control measures. However, where environmental controls have not yet been developed, or when necessary by the nature of the work involved (for example, welding, sand blasting, lead burning), an employee may work for short periods of

time in concentrations of airborne contaminants which exceed the limit of permissible exposure referred to in (d) of this subsection, if the employee wears a respiratory protective device approved by MSHA-NIOSH as protection against the particular hazards involved, and the selection and use of respirators complies with the provisions of chapter 296-62 WAC, Part E.

(g) Employees shall be withdrawn from areas in which there is a concentration of an airborne contaminant which exceeds the permissible exposure limit listed for that contaminant, except as modified in (t)(i) and (ii) of this subsection.

(h) The atmosphere in all underground work areas shall be tested as often as necessary to assure that the atmosphere at normal atmospheric pressure contains at least 19.5 percent oxygen and no more than 22 percent oxygen.

(i) Tests for oxygen content shall be made before tests for air contaminants.

(j) Field-type oxygen analyzers, or other suitable devices, shall be used to test for oxygen deficiency.

(k) The atmosphere in all underground work areas shall be tested quantitatively for carbon monoxide, nitrogen dioxide, hydrogen sulfide, and other toxic gases, dust, vapors, mists, and fumes as often as necessary to ensure that the permissible exposure limits prescribed in chapter 296-62 WAC, Part H, are not exceeded.

(l) The atmosphere in all underground work areas shall be tested quantitatively for methane and other flammable gases as often as necessary to determine:

(i) Whether action is to be taken under (q), (r), and (s) of this subsection; and

(ii) Whether an operation is to be classified potentially gassy or gassy under subsection (11) of this section.

(m) If diesel-engine or gasoline-engine driven ventilating fans or compressors are used, an initial test shall be made of the inlet air of the fan or compressor, with the engines operating, to ensure that the air supply is not contaminated by engine exhaust.

(n) Testing shall be performed as often as necessary to ensure that the ventilation requirements of subsection (15) of this section are met.

(o) When rapid excavation machines are used, a continuous flammable gas monitor shall be operated at the face with the sensor(s) placed as high and close to the front of the machine's cutter head as practicable.

(p) Whenever air monitoring indicates the presence of 5 ppm or more of hydrogen sulfide, a test shall be conducted in the affected underground work area(s), at least at the beginning and midpoint of each shift, until the concentration of hydrogen sulfide has been less than 5 ppm for 3 consecutive days.

(i) Whenever hydrogen sulfide is detected in an amount exceeding 10 ppm, a continuous sampling and indicating hydrogen sulfide monitor shall be used to monitor the affected work area.

(ii) Employees shall be informed when a concentration of 10 ppm hydrogen sulfide is exceeded.

(iii) The continuous sampling and indicating hydrogen sulfide monitor shall be designed, installed, and maintained to provide a visual and aural alarm when the hydrogen sulfide concentration reaches 15 ppm to signal that additional mea-

tures, such as respirator use, increased ventilation, or evacuation, might be necessary to maintain hydrogen sulfide exposure below the permissible exposure limit.

(q) When the competent person determines, on the basis of air monitoring results or other information, that air contaminants may be present in sufficient quantity to be dangerous to life, the employer shall:

(i) Prominently post a notice at all entrances to the underground jobsite to inform all entrants of the hazardous condition; and

(ii) Immediately increase sampling frequency levels to insure workers are not exposed to identified contaminants in excess of the permissible exposure limit(s); and

(iii) Ensure that all necessary precautions are taken to comply with pertinent requirements of this section, and chapter 296-62 WAC.

(r) Whenever five percent or more of the lower explosive limit for methane or other flammable gases is detected in any underground work area(s) or in the air return, steps shall be taken to increase ventilation air volume or otherwise control the gas concentration, unless the employer is operating in accordance with the potentially gassy or gassy operation requirements. Such additional ventilation controls may be discontinued when gas concentrations are reduced below five percent of the lower explosive limit, but shall be reinstated whenever the five percent level is exceeded.

(s) Whenever 10 percent or more of the lower explosive limit for methane or other flammable gases is detected in the vicinity of welding, cutting, or other hot work, such work shall be suspended until the concentration of such flammable gas is reduced to less than 10 percent of the lower explosive limit.

(t) Whenever 20 percent or more of the lower explosive limit for methane or other flammable gases is detected in any underground work area(s) or in the air return:

(i) All employees, except those necessary to eliminate the hazard, shall be immediately withdrawn to a safe location above ground; and

(ii) Employees who remain underground to correct or eliminate the hazard described in (t) above shall be equipped with approved, pressure demand mode, self-contained breathing apparatus, and shall have received adequate training in the proper use of that equipment.

(iii) Electrical power, except for acceptable pumping and ventilation equipment, shall be cut off to the area endangered by the flammable gas until the concentration of such gas is reduced to less than 20 percent of the lower explosive limit.

(14) Additional monitoring for potentially gassy and gassy operations. Operations which meet the criteria for potentially gassy and gassy operations set forth in subsection (13) of this section shall be subject to the additional monitoring requirements of this subsection.

(a) A test for oxygen content shall be conducted in the affected underground work areas and work areas immediately adjacent to such areas at least at the beginning and midpoint of each shift.

(b) When using rapid excavation machines, continuous automatic flammable gas monitoring equipment shall be used to monitor the air at the heading, on the rib, and in the return air duct. The continuous monitor shall signal the heading, and

shut down electric power in the affected underground work area, except for acceptable pumping and ventilation equipment, when 20 percent or more of the lower explosive limit for methane or other flammable gases is encountered.

(i) A manual flammable gas monitor shall be used as needed, but at least at the beginning and midpoint of each shift, to ensure that the limits prescribed in subsections (11) and (13) of this section are not exceeded. In addition, a manual electrical shut down control shall be provided near the heading.

(ii) Local gas tests shall be made prior to and continuously during any welding, cutting, or other hot work.

(iii) In underground operations driven by drill-and-blast methods, the air in the affected area shall be tested for flammable gas prior to re-entry after blasting, and continuously when employees are working underground.

(c) Recordkeeping. A record of all air quality tests shall be maintained above ground at the worksite and be made available to the director or his/her representatives upon request. The record shall include the location, date, time, substance and amount monitored. Records of exposures to toxic substances shall be retained in accordance with Part B, chapter 296-62 WAC. All other air quality test records shall be retained until completion of the project.

(15) Ventilation.

(a)(i) Fresh air shall be supplied to all underground work areas in sufficient quantities to prevent dangerous or harmful accumulation of dust, fumes, mists, vapors, or gases.

(ii) Mechanical ventilation shall be provided in all underground work areas except when the employer can demonstrate that natural ventilation provides the necessary air quality through sufficient air volume and air flow.

(b) A minimum of 200 cubic feet (5.7 m³) of fresh air per minute shall be supplied for each employee underground.

(c) The linear velocity of air flow in the tunnel bore, in shafts, and in all other underground work areas shall be at least 30 feet (9.15 m) per minute where blasting or rock drilling is conducted, or where other conditions likely to produce dust, fumes, mists, vapors, or gases in harmful or explosive quantities are present.

(d) The direction of mechanical air flow shall be reversible.

(e) Air that has passed through underground oil or fuel-storage areas shall not be used to ventilate working areas.

(f) Following blasting, ventilation systems shall exhaust smoke and fumes to the outside atmosphere before work is resumed in affected areas.

(g) Ventilation doors shall be designed and installed so that they remain closed when in use, regardless of the direction of the air flow.

(h) When ventilation has been reduced to the extent that hazardous levels of methane or flammable gas may have accumulated, a competent person shall test all affected areas after ventilation has been restored and shall determine whether the atmosphere is within flammable limits before any power, other than for acceptable equipment, is restored or work is resumed.

(i) Whenever the ventilation system has been shut down with all employees out of the underground area, only competent persons authorized to test for air contaminants shall be

allowed underground until the ventilation has been restored and all affected areas have been tested for air contaminants and declared safe.

(j) When drilling rock or concrete, appropriate dust control measures shall be taken to maintain dust levels within limits set in chapter 296-155 WAC, Part B-1. Such measures may include, but are not limited to, wet drilling, the use of vacuum collectors, and water mix spray systems.

(k)(i) Internal combustion engines, except diesel-powered engines on mobile equipment, are prohibited underground.

(ii) Mobile diesel-powered equipment used underground in atmospheres other than gassy operations shall be either approved by MSHA in accordance with the provisions of 30 CFR Part 32 (formerly Schedule 24), or shall be demonstrated by the employer to be fully equivalent to such MSHA-approved equipment, and shall be operated in accordance with that Part. (Each brake horsepower of a diesel engine requires at least 100 cubic feet (28.32 m³) of air per minute for suitable operation in addition to the air requirements for personnel. Some engines may require a greater amount of air to ensure that the allowable levels of carbon monoxide, nitric oxide, and nitrogen dioxide are not exceeded.)

(iii) Application shall be made to the mining/explosives section, department of labor and industries, for permission to use specified diesel equipment in a specified underground area and shall include the following:

(A) The type of construction and complete identification data and specifications including analysis of the undiluted exhaust gases of the diesel equipment.

(B) The location where the diesel equipment is to be used.

(C) Before the diesel equipment is taken underground, written permission shall be obtained from the department of labor and industries or its duly authorized representative. A satisfactory test on surface, to show that the exhaust gases do not exceed the maximum percentage of carbon monoxide permitted, shall be required.

(D) Diesel equipment shall only be used underground where the ventilation is controlled by mechanical means and shall not be operated if the ventilating current is less than 100 CFM per horsepower based on the maximum brake horsepower of the engines.

(E) Air measurements shall be made at least once daily in the diesel engine working area and the measurements entered in the Underground Diesel Engine Record Book. Permissible maximum amounts of noxious gases are as follows:

At engine exhaust ports	Carbon Monoxide	.10%	1,000 ppm ³
Next to equipment	Carbon Monoxide	.0035%	35 ppm
General atmosphere	Carbon Monoxide	.0035%	35 ppm
General atmosphere	Nitrogen Dioxide	.0001%	1 ppm
General atmosphere	Aldehydes	.0002%	2 ppm

³Parts of vapor or gas per million parts of contaminated air by volume at 25°C and 760 mm Hg. pressure.

(1) Potentially gassy or gassy operations shall have ventilation systems installed which shall:

(i) Be constructed of fire-resistant materials; and

(ii) Have acceptable electrical systems, including fan motors.

(m) Gassy operations shall be provided with controls located aboveground for reversing the air flow of ventilation systems.

(n) In potentially gassy or gassy operations, wherever mine-type ventilation systems using an offset main fan installed on the surface are used, they shall be equipped with explosion-doors or a weak-wall having an area at least equivalent to the cross-sectional area of the airway.

(16) Illumination.

(a) Sufficient lighting shall be provided, in accordance with the requirements of chapter 296-155 WAC, Part B-1, to permit safe operations at the face as well as in the general tunnel or shaft area and at the employees' workplace.

(b) Only acceptable portable lighting shall be used within 50 feet (15.24 m) of any underground heading during explosive handling.

(17) Fire prevention and control. Fire prevention and protection requirements applicable to underground construction operations are found in Part D of this chapter except as modified by the following additional standards.

(a) Open flames and fires are prohibited in all underground construction operations except as permitted for welding, cutting, and other hot work operations.

(i) Smoking may be allowed only in areas free of fire and explosion hazards.

(ii) Readily visible signs prohibiting smoking and open flames shall be posted in areas having fire or explosion hazards.

(iii) The carrying of matches, lighters, or other flame-producing smoking materials shall be prohibited in all underground operations where fire or explosion hazards exist.

(b) The employer may store underground no more than a 24-hour supply of diesel fuel for the underground equipment used at the worksite.

(c) The piping of diesel fuel from the surface to an underground location is permitted only if:

(i) Diesel fuel is contained at the surface in a tank whose maximum capacity is no more than the amount of fuel required to supply for a 24-hour period the equipment serviced by the underground fueling station; and

(ii) The surface tank is connected to the underground fueling station by an acceptable pipe or hose system that is controlled at the surface by a valve, and at the shaft bottom by a hose nozzle; and

(iii) The pipe is empty at all times except when transferring diesel fuel from the surface tank to a piece of equipment in use underground; and

(iv) Hoisting operations in the shaft are suspended during refueling operations if the supply piping in the shaft is not protected from damage.

(d)(i) Gasoline shall not be carried, stored, or used underground.

(ii) Acetylene, liquefied petroleum gas, and methylacetylene propadiene stabilized gas may be used underground only for welding, cutting and other hot work, and only in accordance with Part H of this chapter and subsections (13), (15), (17), and (18) of this section.

(e) Oil, grease, and diesel fuel stored underground shall be kept in tightly sealed containers in fire-resistant areas at least 300 feet (91.44 m) from underground explosive maga-

zines, and at least 100 feet (30.48 m) from shaft stations and steeply inclined passageways. Storage areas shall be positioned or diked so that the contents of ruptured or overturned containers will not flow from the storage area.

(f) Flammable or combustible materials shall not be stored above ground within 100 feet (30.48 m) of any access opening to any underground operation. Where this is not feasible because of space limitations at the jobsite, such materials may be located within the 100-foot limit, provided that:

(i) They are located as far as practicable from the opening; and

(ii) Either a fire-resistant barrier of not less than one-hour rating is placed between the stored material and the opening, or additional precautions are taken which will protect the materials from ignition sources.

(g) Fire-resistant hydraulic fluids shall be used in hydraulically-actuated underground machinery and equipment unless such equipment is protected by a fire suppression system or by multipurpose fire extinguisher(s) rated at a sufficient capacity for the type and size of hydraulic equipment involved, but rated at least 4A:4OB:C.

(h)(i) Electrical installations in underground areas where oil, grease, or diesel fuel are stored shall be used only for lighting fixtures.

(ii) Lighting fixtures in storage areas, or within 25 feet (7.62 m) of underground areas where oil, grease, or diesel fuel are stored, shall be approved for Class I, Division 2 locations, in accordance with Part I of this chapter.

(i) Leaks and spills of flammable or combustible fluids shall be cleaned up immediately.

(j) A fire extinguisher of at least 4A:4OB:C rating or other equivalent extinguishing means shall be provided at the head pulley and at the tail pulley of underground belt conveyors, and at 300-foot intervals along the belt.

(k) Any structure located underground or within 100 feet (30.48 m) of an opening to the underground shall be constructed of material having a fire-resistance rating of at least one hour.

(18) Welding, cutting, and other hot work. In addition to the requirements of Part H of this chapter, the following requirements shall apply to underground welding, cutting, and other hot work.

(a) No more than the amount of fuel gas and oxygen cylinders necessary to perform welding, cutting, or other hot work during the next 24-hour period shall be permitted underground.

(b) Noncombustible barriers shall be installed below welding, cutting, or other hot work being done in or over a shaft or raise.

(19) Ground support.

(a) In tunnels (other than hard rock) timber sets, steel rings, steel frames, concrete liners, or other engineered tunnel support systems shall be used. Every tunnel support system shall be designed by a licensed professional engineer. Design specifications shall be available at the worksite.

(b) Portal areas. Portal openings and access areas shall be guarded by shoring, fencing, head walls, shotcreting, or other equivalent protection to ensure safe access of employees and equipment. Adjacent areas shall be scaled or otherwise

secured to prevent loose soil, rock, or fractured materials from endangering the portal and access area.

(c) Subsidence areas. The employer shall ensure ground stability in hazardous subsidence areas by shoring, by filling in, or by erecting barricades and posting warning signs to prevent entry.

(d) Underground areas.

(i)(A) A competent person shall inspect the roof, face, and walls of the work area at the start of each shift and as often as necessary to determine ground stability.

(B) Competent persons conducting such inspections shall be protected from loose ground by location, ground support, or equivalent means.

(ii) Ground conditions along haulageways and travelways shall be inspected as frequently as necessary to ensure safe passage.

(iii) Loose ground that might be hazardous to employees shall be taken down, scaled, or supported.

(iv) Torque wrenches shall be used wherever bolts that depend on torsionally applied force are used for ground support.

(v) A competent person shall determine whether rock bolts meet the necessary torque, and shall determine the testing frequency in light of the bolt system, ground conditions, and the distance from vibration sources.

(vi) Suitable protection shall be provided for employees exposed to the hazard of loose ground while installing ground support systems.

(vii) Support sets shall be installed so that the bottoms have sufficient anchorage to prevent ground pressures from dislodging the support base of the sets. Lateral bracing (collar bracing, tie rods, or spreaders) shall be provided between immediately adjacent sets to ensure added stability.

(viii) Damaged or dislodged ground supports that create a hazardous condition shall be promptly repaired or replaced. When replacing supports, the new supports shall be installed before the damaged supports are removed.

(ix) A shield or other type of support shall be used to maintain a safe travelway for employees working in dead-end areas ahead of any support replacement operation.

(e) Shafts.

(i) Shafts and wells over 4 feet (1.219 m) in depth that employees must enter shall be supported by a steel casing, concrete pipe, timber, solid rock, or other suitable material.

(ii)(A) The full depth of the shaft shall be supported by casing or bracing except where the shaft penetrates into solid rock having characteristics that will not change as a result of exposure. Where the shaft passes through earth into solid rock, or through solid rock into earth, and where there is potential for shear, the casing or bracing shall extend at least 5 feet (1.53 m) into the solid rock. When the shaft terminates in solid rock, the casing or bracing shall extend to the end of the shaft or 5 feet (1.53 m) into the solid rock, whichever is less.

(B) The casing or bracing shall extend 42 inches (1.07 m) plus or minus 3 inches (8 cm) above ground level, except that the minimum casing height may be reduced to 12 inches (0.3 m), provided that a standard railing is installed; that the ground adjacent to the top of the shaft is sloped away from the shaft collar to prevent entry of liquids; and that effective

barriers are used to prevent mobile equipment operating near the shaft from jumping over the 12-inch (0.3 m) barrier.

(iii) After blasting operations in shafts, a competent person shall determine if the walls, ladders, timbers, blocking, or wedges have loosened. If so, necessary repairs shall be made before employees other than those assigned to make the repairs are allowed in or below the affected areas.

(f) Blasting. This subsection applies in addition to the requirements for blasting and explosives operations, including handling of misfires, which are found in chapter 296-52 WAC.

(i) Blasting wires shall be kept clear of electrical lines, pipes, rails, and other conductive material, excluding earth, to prevent explosives initiation or employee exposure to electric current.

(ii) Following blasting, an employee shall not enter a work area until the air quality meets the requirements of subsection (13) of this section.

(g) Drilling.

(i) A competent person shall inspect all drilling and associated equipment prior to each use. Equipment defects affecting safety shall be corrected before the equipment is used.

(ii) The drilling area shall be inspected for hazards before the drilling operation is started.

(iii) Employees shall not be allowed on a drill mast while the drill bit is in operation or the drill machine is being moved.

(iv) When a drill machine is being moved from one drilling area to another, drill steel, tools, and other equipment shall be secured and the mast shall be placed in a safe position.

(v) Receptacles or racks shall be provided for storing drill steel located on jumbos.

(vi) Employees working below jumbo decks shall be warned whenever drilling is about to begin.

(vii) Drills on columns shall be anchored firmly before starting drilling, and shall be retightened as necessary thereafter.

(viii) The employer shall provide mechanical means on the top deck of a jumbo for lifting unwieldy or heavy material.

(ix) When jumbo decks are over 10 feet (3.05 m) in height, the employer shall install stairs wide enough for two persons.

(x) Jumbo decks more than 10 feet (3.05 m) in height shall be equipped with guardrails on all open sides, excluding access openings of platforms, unless an adjacent surface provides equivalent fall protection.

(xi) Only employees assisting the operator shall be allowed to ride on jumbos, unless the jumbo meets the requirements of subsection (20)(e) of this section.

(xii) Jumbos shall be chocked to prevent movement while employees are working on them.

(xiii) Walking and working surfaces of jumbos shall be maintained to prevent the hazards of slipping, tripping, and falling.

(xiv) Jumbo decks and stair treads shall be designed to be slip-resistant and secured to prevent accidental displacement.

(xv) Scaling bars shall be available at scaling operations and shall be maintained in good condition at all times. Blunted or severely worn bars shall not be used.

(xvi) Before commencing the drill cycle, the face and lifters shall be examined for misfires (residual explosives) and, if found, they shall be removed before drilling commences at the face. Blasting holes shall not be drilled through blasted rock (muck) or water.

(xvii) Employees in a shaft shall be protected either by location or by suitable barrier(s) if powered mechanical loading equipment is used to remove muck containing unfired explosives.

(xviii) A caution sign reading "buried line," or similar wording shall be posted where air lines are buried or otherwise hidden by water or debris.

(20) Haulage.

(a) A competent person shall inspect haulage equipment before each shift.

(i) Equipment defects affecting safety and health shall be corrected before the equipment is used.

(ii) Powered mobile haulage equipment shall be provided with adequate brakes.

(iii) Power mobile haulage equipment, including trains, shall have audible warning devices to warn employees to stay clear. The operator shall sound the warning device before moving the equipment and whenever necessary during travel.

(iv) The operator shall assure that lights which are visible to employees at both ends of any mobile equipment, including a train, are turned on whenever the equipment is operating.

(v) In those cabs where glazing is used, the glass shall be safety glass, or its equivalent, and shall be maintained and cleaned so that vision is not obstructed.

(b) Antirollback devices or brakes shall be installed on inclined conveyor drive units to prevent conveyors from inadvertently running in reverse. Employees shall not be permitted to ride a power-driven chain, belt, or bucket conveyor unless the conveyor is specifically designed for the transportation of persons.

(c) Endless belt-type manlifts are prohibited in underground construction.

(d) General requirements also applicable to underground construction for use of conveyors in construction are found in chapter 296-155 WAC, Part L.

(e) No employee shall ride haulage equipment unless it is equipped with seating for each passenger and protects passengers from being struck, crushed, or caught between other equipment or surfaces. Members of train crews may ride on a locomotive if it is equipped with handholds and nonslip steps or footboards. Requirements applicable to underground construction for motor vehicle transportation of employees are found in chapter 296-155 WAC, Part M.

(f) Conveyor lockout.

(i) Conveyors shall be de-energized and locked out with a padlock, and tagged out with a "Do Not Operate" tag at any time repair, maintenance, or clean-up work is being performed on the conveyor.

(ii) Tags or push button stops are not acceptable.

(iii) Persons shall not be allowed to walk on conveyors except for emergency purposes and then only after the con-

veyor has been deenergized and locked out in accordance with (f) above, and persons can do so safely.

(g) Powered mobile haulage equipment, including trains, shall not be left unattended unless the master switch or motor is turned off; operating controls are in neutral or park position; and the brakes are set, or equivalent precautions are taken to prevent rolling.

(h) Whenever rails serve as a return for a trolley circuit, both rails shall be bonded at every joint and crossbonded every 200 feet (60.96 m).

(i) When dumping cars by hand, the car dumps shall have tiedown chains, bumper blocks, or other locking or holding devices to prevent the cars from overturning.

(j) Rocker-bottom or bottom-dump cars shall be equipped with positive locking devices to prevent unintended dumping.

(k) Equipment to be hauled shall be loaded and secured to prevent sliding or dislodgement.

(l)(i) Mobile equipment, including rail-mounted equipment, shall be stopped for manual connecting or service work, and;

(ii) Employees shall not reach between moving cars during coupling operations.

(iii) Couplings shall not be aligned, shifted, or cleaned on moving cars or locomotives.

(iv) Safety chains or other connections shall be used in addition to couplers to connect person cars or powder cars whenever the locomotive is uphill of the cars.

(v) When the grade exceeds one percent and there is a potential for runaway cars, safety chains or other connections shall be used in addition to couplers to connect haulage cars or, as an alternative, the locomotive must be downhill of the train.

(vi) Such safety chains or other connections shall be capable of maintaining connection between cars in the event of either coupler disconnect, failure or breakage.

(m) Parked rail equipment shall be chocked, blocked, or have brakes set to prevent inadvertent movement.

(n) Berms, bumper blocks, safety hooks, or equivalent means shall be provided to prevent overtravel and overturning of haulage equipment at dumping locations.

(o) Bumper blocks or equivalent stopping devices shall be provided at all track dead ends.

(p)(i) Only small handtools, lunch pails, or similar small items may be transported with employees in person cars, or on top of a locomotive.

(ii) When small hand tools or other small items are carried on top of a locomotive, the top shall be designed or modified to retain them while traveling.

(q)(i) Where switching facilities are available, occupied personnel cars shall be pulled, not pushed. If personnel cars must be pushed and visibility of the track ahead is hampered, then a qualified person shall be stationed in the lead car to give signals to the locomotive operator.

(ii) Crew trips shall consist of personnel loads only.

(21) Electrical safety. This subsection applies in addition to the general requirements for electrical safety which are found in Part I of this chapter.

(a) Electric power lines shall be insulated or located away from water lines, telephone lines, air lines, or other con-

ductive materials so that a damaged circuit will not energize the other systems.

(b) Lighting circuits shall be located so that movement of personnel or equipment will not damage the circuits or disrupt service.

(c) Oil-filled transformers shall not be used underground unless they are located in a fire-resistant enclosure suitably vented to the outside and surrounded by a dike to retain the contents of the transformers in the event of rupture.

(22) Hoisting unique to underground construction except as modified by this section, the following provisions of chapter 296-155 WAC, Part L apply: Requirements for cranes are found in WAC 296-155-525. WAC 296-155-528 contains rules applicable to crane hoisting of personnel, except, that the limitations imposed by WAC 296-155-528(2) do not apply to the routine access of employees to the underground via a shaft. Requirements for personnel hoists, material hoists, and elevators are found in WAC 296-155-530 and in this subsection.

(a) General requirements for cranes and hoists.

(i) Materials, tools, and supplies being raised or lowered, whether within a cage or otherwise, shall be secured or stacked in a manner to prevent the load from shifting, snagging, or falling into the shaft.

(ii) A warning light suitably located to warn employees at the shaft bottom and subsurface shaft entrances shall flash whenever a load is above the shaft bottom or subsurface entrances, or the load is being moved in the shaft. This subsection does not apply to fully enclosed hoistways.

(iii) Whenever a hoistway is not fully enclosed and employees are at the shaft bottom, conveyances or equipment shall be stopped at least 15 feet (4.57 m) above the bottom of the shaft and held there until the signalperson at the bottom of the shaft directs the operator to continue lowering the load, except that the load may be lowered without stopping if the load or conveyance is within full view of a bottom signalperson who is in constant voice communication with the operator.

(iv)(A) Before maintenance, repairs, or other work is commenced in the shaft served by a cage, skip, or bucket, the operator and other employees in the area shall be informed and given suitable instructions.

(B) A sign warning that work is being done in the shaft shall be installed at the shaft collar, at the operator's station, and at each underground landing.

(v) Any connection between the hoisting rope and the cage or skip shall be compatible with the type of wire rope used for hoisting.

(vi) Spin-type connections, where used, shall be maintained in a clean condition and protected from foreign matter that could affect their operation.

(vii) Cage, skip, and load connections to the hoist rope shall be made so that the force of the hoist pull, vibration, misalignment, release of lift force, or impact will not disengage the connection. Only closed shackles shall be used for cage and skip rigging.

(viii) When using wire rope wedge sockets, means shall be provided to prevent wedge escapement and to ensure that the wedge is properly seated.

(b) Additional requirements for cranes. Cranes shall be equipped with a limit switch to prevent overtravel at the boom tip. Limit switches are to be used only to limit travel of loads when operational controls malfunction and shall not be used as a substitute for other operational controls.

(c) Additional requirements for hoists.

(i) Hoists shall be designed so that the load hoist drum is powered in both directions of rotation, and so that brakes are automatically applied upon power release or failure.

(ii) Control levers shall be of the "deadman type" which return automatically to their center (neutral) position upon release.

(iii) When a hoist is used for both personnel hoisting and material hoisting, load and speed ratings for personnel and for materials shall be assigned to the equipment.

(iv) Hoist machines with cast metal parts shall not be used.

(v) Material hoisting may be performed at speeds higher than the rated speed for personnel hoisting if the hoist and components have been designed for such higher speeds and if shaft conditions permit.

(vi) Employees shall not ride on top of any cage, skip, or bucket except when necessary to perform inspection or maintenance of the hoisting system, in which case they shall be protected by a body belt/harness system to prevent falling.

(vii) Personnel and materials (other than small tools and supplies secured in a manner that will not create a hazard to employees) shall not be hoisted together in the same conveyance. However, if the operator is protected from the shifting of materials, then the operator may ride with materials in cages or skips which are designed to be controlled by an operator within the cage or skip.

(viii) Line speed shall not exceed the design limitations of the systems.

(ix) Hoists shall be equipped with landing level indicators at the operator's station. Marking of the hoist rope does not satisfy this requirement.

(x) Whenever glazing is used in the hoist house, it shall be safety glass, or its equivalent, and be free of distortions and obstructions.

(xi) A fire extinguisher that is rated at least 2A:10B:C (multipurpose, dry chemical) shall be mounted in each hoist house.

(xii) Hoist controls shall be arranged so that the operator can perform all operating cycle functions and reach the emergency power cutoff without having to reach beyond the operator's normal operating position.

(xiii) Hoists shall be equipped with limit switches to prevent overtravel at the top and bottom of the hoistway.

(xiv) Limit switches are to be used only to limit travel of loads when operational controls malfunction and shall not be used as a substitute for other operational controls.

(xv) Hoist operators shall be provided with a closed-circuit voice communication system to each landing station, with speaker-microphones so located that the operator can communicate with individual landing stations during hoist use.

(xvi) When sinking shafts 75 feet (22.86 m) or less in depth, cages, skips, and buckets that may swing, bump, or snag against shaft sides or other structural protrusions shall

be guided by fenders, rails, ropes, or a combination of those means.

(xvii) When sinking shafts more than 75 feet (22.86 m) in depth, all cages, skips, and buckets shall be rope or rail-guided to within a rail length from the sinking operation.

(xviii) Cages, skips, and buckets in all completed shafts, or in all shafts being used as completed shafts, shall be rope or rail-guided for the full length of their travel.

(xix) Wire rope used in load lines of material hoists shall be capable of supporting, without failure, at least five times the maximum intended load or the factor recommended by the rope manufacturer, whichever is greater. Refer to chapter 296-155 WAC, Part L, for design factors for wire rope used in personnel hoists. The design factors shall be calculated by dividing the breaking strength of wire rope, as reported in the manufacturer's rating tables, by the total static load, including the weight of the wire rope in the shaft when fully extended.

(xx) A competent person shall visually check all hoisting machinery, equipment, anchorages, and hoisting rope at the beginning of each shift and during hoist use, as necessary.

(xxi) Each safety device shall be checked by a competent person at least weekly during hoist use to ensure suitable operation and safe condition.

(xxii) In order to ensure suitable operation and safe condition of all functions and safety devices, each hoist assembly shall be inspected and load-tested to 100 percent of its rated capacity: At the time of installation; after any repairs or alterations affecting its structural integrity; after the operation of any safety device; and annually when in use. The employer shall prepare a certification record which includes the date each inspection and load-test was performed; the signature of the person who performed the inspection and test; and a serial number or other identifier for the hoist that was inspected and tested. The most recent certification record shall be maintained on file until completion of the project.

(xxiii) Before hoisting personnel or material, the operator shall perform a test run of any cage or skip whenever it has been out of service for one complete shift, and whenever the assembly or components have been repaired or adjusted.

(xiv) Unsafe conditions shall be corrected before using the equipment.

(d) Additional requirements for personnel hoists.

(i) Hoist drum systems shall be equipped with at least two means of stopping the load, each of which shall be capable of stopping and holding 150 percent of the hoist's rated line pull. A broken-rope safety, safety catch, or arrestment device is not a permissible means of stopping under this subsection.

(ii) The operator shall remain within sight and sound of the signals at the operator's station.

(iii) All sides of personnel cages shall be enclosed by one-half inch (12.70 mm) wire mesh (not less than No. 14 gauge or equivalent) to a height of not less than 6 feet (1.83 m). However, when the cage or skip is being used as a work platform, its sides may be reduced in height to 42 inches (1.07 m) when the conveyance is not in motion.

(iv) All personnel cages shall be provided with a positive locking door that does not open outward.

(v) All personnel cages shall be provided with a protective canopy. The canopy shall be made of steel plate, at least

3/16 -inch (4.763 mm) in thickness, or material of equivalent strength and impact resistance. The canopy shall be sloped to the outside, and so designed that a section may be readily pushed upward to afford emergency egress. The canopy shall cover the top in such a manner as to protect those inside from objects falling in the shaft.

(vi) Personnel platforms operating on guide rails or guide ropes shall be equipped with broken-rope safety devices, safety catches, or arrestment devices that will stop and hold 150 percent of the weight of the personnel platform and its maximum rated load.

(vii) During sinking operations in shafts where guides and safeties are not yet used, the travel speed of the personnel platform shall not exceed 200 feet (60.96 m) per minute. Governor controls set for 200 feet (60.96 m) per minute shall be installed in the control system and shall be used during personnel hoisting.

(viii) The personnel platform may travel over the controlled length of the hoistway at rated speeds up to 600 feet (182.88 m) per minute during sinking operations in shafts where guides and safeties are used.

(ix) The personnel platform may travel at rated speeds greater than 600 feet (182.88 m) per minute in complete shafts.

[Statutory Authority: RCW 49.17.010, [49.17].040, [49.17].050 and [49.17].060. 98-05-046, § 296-155-730, filed 2/13/98, effective 4/15/98. Statutory Authority: Chapter 49.17 RCW. 95-04-007, § 296-155-730, filed 1/18/95, effective 3/1/95; 94-15-096 (Order 94-07), § 296-155-730, filed 7/20/94, effective 9/20/94; 91-11-070 (Order 91-01), § 296-155-730, filed 5/20/91, effective 6/20/91; 90-03-029 (Order 89-20), § 296-155-730, filed 1/11/90, effective 2/26/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-730, filed 1/21/86; Order 76-29, § 296-155-730, filed 9/30/76; Order 74-26, § 296-155-730, filed 5/7/74, effective 6/6/74.]

WAC 296-155-735 Caissons. (1) Wherever, in caisson work in which compressed air is used, and the working chamber is less than 11 feet in length, and when such caissons are at any time suspended or hung while work is in progress so that the bottom of the excavation is more than 9 feet below the deck of the working chamber, a shield shall be erected therein for the protection of the employees.

(2) Shafts shall be subjected to a hydrostatic or airpressure test, at which pressure they shall be tight. The shaft shall be stamped on the outside shell about 12 inches from each flange to show the pressure to which they have been subjected.

(3) Whenever a shaft is used, it shall be provided, where space permits, with a safe, proper, and suitable staircase for its entire length, including landing platforms, not more than 20 feet apart. Where this is impracticable, suitable ladders shall be installed with landing platforms located about 20 feet apart to break the climb.

(4) All caissons, having a diameter or side greater than 10 feet shall be provided with a man lock and shaft for the exclusive use of employees.

(5) In addition to the gauge in the locks, an accurate gauge shall be maintained on the outer and inner side of each bulkhead. These gauges shall be accessible at all times and kept in accurate working order.

(1999 Ed.)

(6) In caisson operations where employees are exposed to compressed air working environments, the requirements contained in WAC 296-155-745 shall be complied with.

[Order 74-26, § 296-155-735, filed 5/7/74, effective 6/6/74.]

WAC 296-155-740 Cofferdams. (1) If overtopping of the cofferdam by high waters is possible, means shall be provided for controlled flooding of the work area.

(2) Warning signals for evacuation of employees in case of emergency shall be developed and posted.

(3) Cofferdam walkways, bridges, or ramps with at least two means of rapid exit, shall be provided with guardrails as specified in Part K of this chapter.

(4) Manways and ladderways shall be installed separately from the hoistways and partitioned off to prevent hoisted materials from protruding into or falling into manways and/or ladderways.

(5) Pumping equipment shall be located on substantially constructed platforms and where installed in such a position that persons must work below, toe boards shall be installed on the platform.

(6) Cofferdams located close to navigable shipping channels shall be protected from vessels in transit, where possible.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-740, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-740, filed 4/25/95, effective 10/1/95; Order 74-26, § 296-155-740, filed 5/7/74, effective 6/6/74.]

WAC 296-155-745 Compressed air. (1) General provisions.

(a) There shall be present, at all times, at least one competent person designated by and representing the employer, who shall be familiar with this part in all respects and responsible for full compliance with these and other applicable parts.

(b) Every employee shall be instructed in the rules and regulations which concern their safety or the safety of others.

(2) Medical attendance, examination, and regulations.

(a) There shall be retained one or more licensed physicians familiar with and experienced in the physical requirements and the medical aspects of compressed air work and the treatment of decompression illness. They shall be available at all times while work is in progress in order to provide medical supervision of employees employed in compressed air work. They shall be physically qualified and be willing to enter a pressurized environment.

(b) No employee shall be permitted to enter a compressed air environment until they have been examined by the physician and reported to be physically qualified to engage in such work.

(c) In the event an employee is absent from work for 10 days, or is absent due to sickness or injury, they shall not resume work until they are reexamined by the physician, and their physical condition reported, as provided in this subsection, to be such as to permit them to work in compressed air.

(d) After an employee has been employed continuously in compressed air for a period designated by the physician, but not to exceed 1 year, the employee shall be reexamined by the physician to determine if they are still physically qualified to engage in compressed air work.

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(e) Such physician shall at all times keep a complete and full record of examinations made by themselves. The physician shall also keep an accurate record of any decompression illness or other illness or injury incapacitating any employee for work, and of all loss of life that occurs in the operation of a tunnel, caisson, or other compartment in which compressed air is used.

(f) Records shall be available for the inspection by the director or his/her representatives, and a copy thereof shall be forwarded to the department within 48 hours following the occurrence of the accident, death, injury, or decompression illness. It shall state as fully as possible the cause of said death or decompression illness, and the place where the injured or sick employee was taken, and such other relative information as may be required by the director.

(g) A fully equipped first-aid station shall be provided at each tunnel project regardless of the number of persons employed. An ambulance or transportation suitable for a litter case shall be at each project.

(h) Where tunnels are being excavated from portals more than 5 road miles apart, a first-aid station and transportation facilities shall be provided at each portal.

(i) A medical lock shall be established and maintained in immediate working order whenever air pressure in the working chamber is increased above the normal atmosphere.

(j) The medical lock shall:

(i) Have at least 6 feet of clear headroom at the center, and be subdivided into not less than two compartments;

(ii) Be readily accessible to employees working under compressed air;

(iii) Be kept ready for immediate use for at least 5 hours subsequent to the emergence of any employee from the working chamber;

(iv) Be properly heated, lighted and ventilated;

(v) Be maintained in a sanitary condition;

(vi) Have a nonshatterable port through which the occupant(s) may be kept under constant observation;

(vii) Be designed for a working pressure of 75 p.s.i.g.;

(viii) Be equipped with internal controls which may be overridden by external controls;

(ix) Be provided with air pressure gauges to show the air pressure within each compartment to observers inside and outside the medical lock;

(x) Be equipped with a manual type sprinkler system that can be activated inside the lock or by the outside lock tender;

(xi) Be provided with oxygen lines and fittings leading into external tanks. The lines shall be fitted with check valves to prevent reverse flow. The oxygen system inside the chamber shall be of a closed circuit design and be so designed as to automatically shut off the oxygen supply whenever the fire system is activated.

(xii) Be in constant charge of an attendant under the direct control of the retained physician. The attendant shall be trained in the use of the lock and suitably instructed regarding steps to be taken in the treatment of employee exhibiting symptoms compatible with a diagnosis of decompression illness;

(xiii) Be adjacent to an adequate emergency medical facility;

(xiv) The medical facility shall be equipped with demand-type oxygen inhalation equipment approved by the U.S. Bureau of Mines or Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH);

(xv) Be capable of being maintained at a temperature, in use, not to exceed 90°F. nor be less than 70°F.; and

(xvi) Be provided with sources of air, free of oil and carbon monoxide, for normal and emergency use, which are capable of raising the air pressure in the lock from 0 to 75 p.s.i.g. in 5 minutes.

(k) Identification badges shall be furnished to all employees, indicating that the wearer is a compressed air worker. A permanent record shall be kept of all identification badges issued. The badge shall give the employee's name, address of the medical lock, the telephone number of the licensed physician for the compressed air project, and contain instructions that in case of emergency of unknown or doubtful cause or illness, the wearer shall be rushed to the medical lock. The badge shall be worn at all times—off the job, as well as on the job.

(3) Telephone and signal communication. Effective and reliable means of communication, such as bells, whistles, or telephones, shall be maintained at all times between all the following locations;

(a) The working chamber face;

(b) The working chamber side of the man lock near the door;

(c) The interior of the man lock;

(d) Lock attendant's station;

(e) The compressor plant;

(f) The first-aid station;

(g) The emergency lock (if one is required); and
(h) The special decompression chamber (if one is required).

(4) Signs and records.

(a) The time of decompression shall be posted in each man lock as follows:

TIME OF DECOMPRESSION FOR THIS LOCK

..... pounds to pounds in minutes.

..... pounds to pounds in minutes.

(Signed by)

(Superintendent)

This form shall be posted in the man lock at all times.

(b) Any code of signals used shall be conspicuously posted near workplace entrances and such other locations as may be necessary to bring them to the attention of all employees concerned.

(c) For each 8-hour shift, a record of employees employed under air pressure shall be kept by an employee who shall remain outside the lock near the entrance. This record shall show the period each employee spends in the air chamber and the time taken from decompression. A copy shall be submitted to the appointed physician after each shift.

(5) Compression.

(a) Every employee going under air pressure for the first time shall be instructed on how to avoid excessive discomfort.

(b) During the compression of employees, the pressure shall not be increased to more than 3 p.s.i.g. within the first minute. The pressure shall be held at 3 p.s.i.g. and again at 7 p.s.i.g. sufficiently long to determine if any employees are experiencing discomfort.

(c) After the first minute the pressure shall be raised uniformly and at a rate not to exceed 10 p.s.i. per minute.

(d) If any employee complains of discomfort, the pressure shall be held to determine if the symptoms are relieved. If, after 5 minutes the discomfort does not disappear, the lock attendant shall gradually reduce the pressure until the employee signals that the discomfort has ceased. If the employee does not indicate that the discomfort has disappeared, the lock attendant shall reduce the pressure to atmospheric and the employee shall be released from the lock.

(e) No employee shall be subjected to pressure exceeding 50 pounds per square inch except in an emergency.

(6) Decompression.

(a) Decompression to normal condition shall be in accordance with the decompression tables in Appendix A of this part.

(b) In the event it is necessary for an employee to be in compressed air more than once in a 24-hour period, the appointed physician shall be responsible for the establishment of methods and procedures of decompression applicable to repetitive exposures.

(c) If decanting is necessary, the appointed physician shall establish procedures before any employee is permitted to be decompressed by decanting methods. The period of time that the employees spend at atmospheric pressure between the decompression following the shift and recompression shall not exceed 5 minutes.

(7) Man locks and special decompression chambers.

(a) Man locks.

(i) Except in emergency, no employees employed in compressed air shall be permitted to pass from the working chamber to atmospheric pressure until after decompression, in accordance with the procedures in this part.

(ii) The lock attendant in charge of a man lock shall be under the direct supervision of the appointed physician. The lock attendant shall be stationed at the lock controls on the free air side during the period of compression and decompression and shall remain at the lock control station whenever there are persons in the working chamber or in the man lock.

(iii) Except where air pressure in the working chamber is below 12 p.s.i.g., each man lock shall be equipped with automatic controls which, through taped programs, cams, or similar apparatus, shall automatically regulate decompressions. It shall also be equipped with manual controls to permit the lock attendant to override the automatic mechanism in the event of an emergency, as provided in item (viii) of this subdivision.

(iv) A manual control, which can be used in the event of an emergency, shall be placed inside the man lock.

(v) A clock, thermometer, and continuous recording pressure gauge with a 4-hour graph shall be installed outside of each man lock and shall be changed prior to each shift's decompression. The chart shall be of sufficient size to register a legible record of variations in pressure within the man lock and shall be visible to the lock attendant. A copy of each

graph shall be submitted to the appointed physician after each shift. In addition, a pressure gauge, clock, and thermometer shall also be installed in each man lock. Additional fittings shall be provided so that the test gauges may be attached whenever necessary.

(vi) Except where air pressure is below 12 p.s.i.g. and there is no danger of rapid flooding, all caissons having a working area greater than 150 square feet, and each bulkhead in tunnels of 14 feet or more in diameter, or equivalent area, shall have at least two locks in perfect working condition, one of which shall be used exclusively as a man lock, the other, as a materials lock.

(vii) Where only a combination man-and-materials lock is required, this single lock shall be of sufficient capacity to hold the employees constituting two successive shifts.

(viii) Emergency locks shall be large enough to hold an entire heading shift and a limit maintained of 12 p.s.i.g. There shall be a chamber available for oxygen decompression therapy to 28 p.s.i.g.

(ix) The man lock shall be large enough so that those using it are not compelled to be in a cramped position and shall not have less than 5 feet clear head room at the center and a minimum of 30 cubic feet of air space per occupant.

(x) Locks on caissons shall be so located that the bottom door shall be not less than 3 feet above the water level surrounding the caisson on the outside. (The water level, where it is affected by tides, is construed to mean high tide.)

(xi) In addition to the pressure gauge in the locks, an accurate pressure gauge shall be maintained on the outer and inner side of each bulkhead. These gauges shall be accessible at all times and shall be kept in accurate working order.

(xii) Man locks shall have an observation port at least 4 inches in diameter located in such a position that all occupants of the man lock may be observed from the working chamber and from the free air side of the lock.

(xiii) Adequate ventilation in the lock shall be provided.

(xiv) Man locks shall be maintained at a minimum temperature of 70°F.

(xv) When locks are not in use and employees are in the working chamber, lock doors shall be kept open to the working chamber, where practicable.

(xvi) Provision shall be made to allow for rescue parties to enter the tunnel if the working force is disabled.

(xvii) A special decompression chamber of sufficient size to accommodate the entire force of employees being decompressed at the end of a shift shall be provided whenever the regularly established working period requires total time of decompression exceeding 75 minutes.

(b) Special decompression chamber.

(i) The headroom in the special decompression chamber shall be not less than a minimum 7 feet and the cubical content shall provide at least 50 cubic feet of airspace for each employee. For each occupant, there shall be provided 4 square feet of free walking area and 3 square feet of seating space, exclusive of area required for lavatory and toilet facilities. The rated capacity shall be based on the stated minimum space per employee and shall be posted at the chamber entrance. The posted capacity shall not be exceeded, except in case of emergency.

(ii) Each special decompression chamber shall be equipped with the following:

(A) A clock or clocks suitably placed so that the attendant and the chamber occupants can readily ascertain the time;

(B) Pressure gauges which will indicate to the attendants and to the chamber occupants the pressure in the chamber;

(C) Valves to enable the attendant to control the supply and discharge of compressed air into and from the chamber.

(D) Valves and pipes, in connection with the air supply and exhaust, arranged so that the chamber pressure can be controlled from within and without;

(E) Effective means of oral intercommunication between the attendant, occupants of the chamber, and the air compressor plant; and

(F) An observation port at the entrance to permit observation of the chamber occupants.

(iii) Seating facilities in special decompression chambers shall be so arranged as to permit a normal sitting posture without cramping. Seating space, not less than 18 inches by 24 inches wide, shall be provided per occupant.

(iv) Adequate toilet and washing facilities, in a screened or enclosed recess, shall be provided. Toilet bowls shall have a built-in protector on the rim so that an air space is created when the seat lid is closed.

(v) Fresh and pure drinking water shall be available. This may be accomplished by either piping water into the special decompression chamber and providing drinking fountains, or by providing individual canteens, or by some other sanitary means. Community drinking vessels are prohibited.

(vi) No refuse or discarded material of any kind shall be permitted to accumulate, and the chamber shall be kept clean.

(vii) Unless the special decompression chamber is serving as the man lock to atmospheric pressure, the special decompression chamber shall be situated, where practicable, adjacent to the man lock on the atmospheric pressure side of the bulkhead. A passageway shall be provided, connecting the special chamber with the man lock, to permit employees in the process of decompression to move from the man lock to the special chamber without a reduction in the ambient pressure from that designated for the next stage of decompression. The passageway shall be so arranged as to not interfere with the normal operation of the man lock, nor with the release of the occupants of the special chamber to atmospheric pressure upon the completion of the decompression procedure.

(8) Compressor plant and air supply.

(a) At all times there shall be a thoroughly experienced, competent, and reliable person on duty at the air control valves as a gauge tender who shall regulate the pressure in the working areas. During tunneling operations, one gauge tender may regulate the pressure in not more than two headings: Provided; That the gauges and controls are all in one location. In caisson work, there shall be a gauge tender for each caisson.

(b) The low air compressor plant shall be of sufficient capacity to not only permit the work to be done safely, but shall also provide a margin to meet emergencies and repairs.

(c) Low air compressor units shall have at least two independent and separate sources of power supply and each shall

be capable of operating the entire low air plant and its accessory systems.

(d) The capacity, arrangement, and number of compressors shall be sufficient to maintain the necessary pressure without overloading the equipment and to assure maintenance of such pressure in the working chamber during periods of breakdown, repair, or emergency.

(e) Switching from one independent source of power supply to the other shall be done periodically to ensure that workability of the apparatus in an emergency.

(f) Duplicate low-pressure air feedlines and regulating valves shall be provided between the source of air supply and a point beyond the locks with one of the lines extending to within 100 feet of the working face.

(g) All high-pressure and low-pressure air supply lines shall be equipped with check valves.

(h) Low-pressure air shall be regulated automatically. In addition, manually operated valves shall be provided for emergency conditions.

(i) The air intakes for all air compressors shall be located at a place where fumes, exhaust gases, and other air contaminants will be at a minimum.

(j) Gauges indicating the pressure in the working chamber shall be installed in the compressor building, the lock attendant's station, and at the employer's field office.

(9) Ventilation and air quality.

(a) Exhaust valves and exhaust pipes shall be provided and operated so that the working chamber shall be well ventilated, and there shall be no pockets of dead air. Outlets may be required at intermediate points along the main low-pressure air supply line to the heading to eliminate such pockets of dead air. The quantity of ventilation air shall be not less than 30 cubic feet per minute.

(b) The air in the workplace shall be analyzed by the employer not less than once each shift, and records of such tests shall be kept on file at the place where the work is in progress. The test results shall be within the threshold limit values specified in part B of this chapter, for hazardous gases, and within 10 percent of the lower explosive limit of flammable gases. If these limits are not met, immediate action to correct the situation shall be taken by the employer.

(c) The temperature of all working chambers which are subjected to air pressure shall, by means of after-coolers or other suitable devices, be maintained at a temperature not to exceed 85°F.

(d) Forced ventilation shall be provided during decompression. During the entire decompression period, forced ventilation through chemical or mechanical air purifying devices that will ensure a source of fresh air shall be provided.

(e) Whenever heat-producing machines (moles, shields) are used in compressed air tunnel operations, a positive means of removing the heat build-up at the heading shall be provided.

(10) Electricity.

(a) All lighting in compressed-air chambers shall be by electricity exclusively, and two independent electric-lighting systems with independent sources of supply shall be used. The emergency source shall be arranged to become automat-

ically operative in the event of failure of the regularly used source.

(b) The minimum intensity of light on any walkway, ladder, stairway, or working level shall be not less than 10 foot-candles, and in all workplaces the lighting shall at all times be such as to enable employees to see clearly.

(c) All electrical equipment, and wiring for light and power circuits, shall comply with requirements of Part I, of this standard, for use in damp, hazardous, high temperature, and compressed air environments.

(d) External parts of lighting fixtures and all other electrical equipment, when within 8 feet of the floor, shall be constructed of noncombustible, nonabsorptive, insulating materials, except that metal may be used if it is effectively grounded.

(e) Portable lamps shall be equipped with noncombustible, nonabsorptive, insulating sockets, approved handles, basket guards, and approved cords.

(f) The use of worn or defective portable and pendant conductors is prohibited.

(11) Sanitation.

(a) Sanitary, heated, lighted, and ventilated dressing rooms and drying rooms shall be provided for all employees engaged in compressed air work. Such rooms shall contain suitable benches and lockers. Bathing accommodations (showers at the ratio of one to 10 employees per shift), equipped with running hot and cold water, and suitable and adequate toilet accommodations, shall be provided. One toilet for each 15 employees, or fractional part thereof, shall be provided.

(b) When the toilet bowl is shut by a cover, there should be an air space so that the bowl or bucket does not implode when pressure is increased.

(c) All parts of caissons and other working compartments shall be kept in a sanitary condition.

(12) Fire prevention and protection.

(a) Fire fighting equipment shall be available at all times and shall be maintained in working condition.

(b) While welding or flame-cutting is being done in compressed air, a firewatch with a fire hose or approved extinguisher shall stand by until such operation is completed.

(c) Shafts and caissons containing flammable material of any kind, either above or below ground, shall be provided with a waterline and a fire hose connected thereto, so arranged that all points of the shaft or caisson are within reach of the hose stream.

(d) Fire hose shall be at least 1 1/2 inches in nominal diameter; the water pressure shall at all times be adequate for efficient operation of the type of nozzle used; and the water supply shall be such as to ensure an uninterrupted flow. Fire hose, when not in use, shall be located or guarded to prevent injury thereto.

(e) The power house, compressor house, and all buildings housing ventilating equipment, shall be provided with at least one hose connection in the waterline, with a fire hose connected thereto. A fire hose shall be maintained within reach of structures of wood over or near shafts.

(f) Tunnels shall be provided with a 2-inch minimum diameter waterline extending into the working chamber and to within 100 feet of the working face. Such line shall have

hose outlets with 100 feet of fire hose attached and maintained as follows: One at the working face; one immediately inside of the bulkhead of the working chamber; and one immediately outside such bulkhead. In addition, hose outlets shall be provided at 200-foot intervals throughout the length of the tunnel, and 100 feet of fire hose shall be attached to the outlet nearest to any location where flammable material is being kept or stored or where any flame is being used.

(g) In addition to fire hose protection required by this part, on every floor of every building not under compressed air, but used in connection with the compressed air work, there shall be provided at least one approved fire extinguisher of the proper type for the hazards involved. At least two approved fire extinguishers shall be provided in the working chamber as follows: One at the working face and one immediately inside the bulkhead (pressure side). Extinguishers in the working chamber shall use water as the primary extinguishing agent and shall not use any extinguishing agent which could be harmful to the employees in the working chamber. The fire extinguisher shall be protected from damage.

(h) Highly combustible materials shall not be used or stored in the working chamber. Wood, paper, and similar combustible material shall not be used in the working chamber in quantities which could cause a fire hazard. The compressor building shall be constructed of noncombustible material.

(i) Man locks shall be equipped with a manual type fire extinguisher system that can be activated inside the man lock and also by the outside lock attendant. In addition, a fire hose and portable fire extinguisher shall be provided inside and outside the man lock. The portable fire extinguisher shall be the dry chemical type.

(j) Equipment, fixtures, and furniture in man locks and special decompression chambers shall be constructed of noncombustible materials. Bedding, etc., shall be chemically treated so as to be fire resistant.

(k) Head frames shall be constructed of structural steel or open frame-work fireproofed timber. Head houses and other temporary surface buildings or structures within 100 feet of the shaft, caisson, or tunnel opening shall be built of fire-resistant materials.

(l) No oil, gasoline, or other combustible materials shall be stored within 100 feet of any shaft, caisson, or tunnel opening, except that oils may be stored in suitable tanks in isolated fireproof buildings, provided such buildings are not less than 50 feet from any shaft, caisson, or tunnel opening, or any building directly connected thereto.

(m) Positive means shall be taken to prevent leaking flammable liquids from flowing into the areas specifically mentioned in the preceding subdivision.

(n) All explosives used in connection with compressed air work shall be selected, stored, transported, and used as specified in part T of this chapter.

(13) Bulkheads and safety screens.

(a) Intermediate bulkheads with locks, or intermediate safety screens or both, are required where there is danger of rapid flooding.

(b) In tunnels 16 feet or more in diameter, hanging walkways shall be provided from the face to the man lock as high

in the tunnel as practicable, with at least 6 feet of head room. Walkways shall be constructed of noncombustible material. Standard railings shall be securely installed throughout the length of all walkways on open sides in accordance with Part K of this chapter. Where walkways are ramped under safety screens, the walkway surface shall be skidproofed by cleats or by equivalent means.

(c) Bulkheads used to contain compressed air shall be tested, where practicable, to prove their ability to resist the highest air pressure which may be expected to be used.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-745, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-745, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-745, filed 7/20/94, effective 9/20/94; 88-23-054 (Order 88-25), § 296-155-745, filed 11/14/88; Order 74-26, § 296-155-745, filed 5/7/74, effective 6/6/74.]

WAC 296-155-74501 Appendix A—Decompression tables.

APPENDIX A—DECOMPRESSION TABLES

(1) **Explanation.** The decompression tables are computed for working chamber pressures from 0 to 14 pounds, and from 14 to 50 pounds per square inch gauge inclusive by 2-pound increments and for exposure times for each pressure extending from one-half to over 8 hours inclusive. Decompressions will be conducted by two or more stages with a maximum of four stages, the latter for a working chamber pressure of 40 pounds per square inch gauge or over.

Stage 1 consists of a reduction in ambient pressure ranging from 10 to a maximum of 16 pounds per square inch, but in no instance will the pressure be reduced below 4 pounds at the end of stage 1. This reduction in pressure in stage 1 will always take place at a rate not greater than 5 pounds per minute.

Further reduction in pressure will take place during stage 2 and subsequent stages as required at a slower rate, but in no event at a rate greater than 1 pound per minute.

Decompression Table No. 1 indicates in the body of the table the total decompression time in minutes for various combinations of working chamber pressure and exposure time.

Decompression Table No. 2 indicates for the same various combinations of working chamber pressure and exposure time the following:

- (a) The number of stages required;
- (b) The reduction in pressure and the terminal pressure for each required stage;
- (c) The time in minutes through which the reduction in pressure is accomplished for each required stage;
- (d) The pressure reduction rate in minutes per pound for each required stage;

Important note: The pressure reduction in each stage is accomplished at a uniform rate. Do not interpolate between values shown on the tables. Use the next higher value of working chamber pressure or exposure time should the actual working chamber pressure or the actual exposure time, respectively, fall between those for which calculated values are shown in the body of the tables.

Examples:

Example No. 1:

4 hours working period at 20 pounds gauge.

Decompression Table No. 1:

20 pounds for 4 hours, total decompression time. 43 minutes.

Decompression Table No. 2:

Stage 1: Reduce pressure from 20 pounds to 4 pounds at the uniform rate of 5 pounds per minute.

Elapsed time stage 1: 16/5— 3 minutes.

Stage 2 (final stage): Reduce pressure at a uniform rate from 4 pounds to 0-pound gage over a period of 40 minutes.

Rate—0.10 per pound per minute or 10 minutes per pound.

Stage 2 (final) elapsed time. 40 minutes.

Total time 43 minutes.

Example No. 2:

5-hour working period at 24 pounds gage.

Decompression Table No. 1:

24 pounds for 5 hours, total decompression time. 117 minutes.

Decompression Table No. 2:

Stage 1: Reduce pressure from 24 pounds to 8 pounds at the uniform rate of 5 pounds per minute.

Elapsed time stage 1: 16/5 3 minutes.

Stage 2: Reduce pressure at a uniform rate from 8 pounds to 4 pounds over a period of 4 minutes. Rate, 1 pound per minute elapsed time, stage 2 4 minutes.

Transfer person to special decompression chamber maintaining the 4-pound pressure during the transfer operation.

Stage 3 (final stage): In the special decompression chamber, reduce the pressure at a uniform rate from 4 pounds to 0-pound gage over a period of 110 minutes. Rate, 0.037 pound per minute or 27.5 minutes per pound. Stage 3 (final) elapsed time 110 minutes.

Total time 117 minutes.

in the tunnel as practicable, with at least 6 feet of head room. Walkways shall be constructed of noncombustible material. Standard railings shall be securely installed throughout the length of all walkways on open sides in accordance with Part K of this chapter. Where walkways are ramped under safety screens, the walkway surface shall be skidproofed by cleats or by equivalent means.

(c) Bulkheads used to contain compressed air shall be tested, where practicable, to prove their ability to resist the highest air pressure which may be expected to be used.

[Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-24-051, § 296-155-745, filed 11/27/96, effective 2/1/97. Statutory Authority: Chapter 49.17 RCW. 95-10-016, § 296-155-745, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-745, filed 7/20/94, effective 9/20/94; 88-23-054 (Order 88-25), § 296-155-745, filed 11/14/88; Order 74-26, § 296-155-745, filed 5/7/74, effective 6/6/74.]

WAC 296-155-74501 Appendix A—Decompression tables.

APPENDIX A—DECOMPRESSION TABLES

(1) **Explanation.** The decompression tables are computed for working chamber pressures from 0 to 14 pounds, and from 14 to 50 pounds per square inch gauge inclusive by 2-pound increments and for exposure times for each pressure extending from one-half to over 8 hours inclusive. Decompressions will be conducted by two or more stages with a maximum of four stages, the latter for a working chamber pressure of 40 pounds per square inch gauge or over.

Stage 1 consists of a reduction in ambient pressure ranging from 10 to a maximum of 16 pounds per square inch, but in no instance will the pressure be reduced below 4 pounds at the end of stage 1. This reduction in pressure in stage 1 will always take place at a rate not greater than 5 pounds per minute.

Further reduction in pressure will take place during stage 2 and subsequent stages as required at a slower rate, but in no event at a rate greater than 1 pound per minute.

Decompression Table No. 1 indicates in the body of the table the total decompression time in minutes for various combinations of working chamber pressure and exposure time.

Decompression Table No. 2 indicates for the same various combinations of working chamber pressure and exposure time the following:

- (a) The number of stages required;
- (b) The reduction in pressure and the terminal pressure for each required stage;
- (c) The time in minutes through which the reduction in pressure is accomplished for each required stage;
- (d) The pressure reduction rate in minutes per pound for each required stage;

Important note: The pressure reduction in each stage is accomplished at a uniform rate. Do not interpolate between values shown on the tables. Use the next higher value of working chamber pressure or exposure time should the actual working chamber pressure or the actual exposure time, respectively, fall between those for which calculated values are shown in the body of the tables.

Examples:

Example No. 1:

4 hours working period at 20 pounds gauge.

Decompression Table No. 1:

20 pounds for 4 hours, total decompression time. 43 minutes.

Decompression Table No. 2:

Stage 1: Reduce pressure from 20 pounds to 4 pounds at the uniform rate of 5 pounds per minute.

Elapsed time stage 1: 16/5— 3 minutes.

Stage 2 (final stage): Reduce pressure at a uniform rate from 4 pounds to 0-pound gage over a period of 40 minutes.

Rate—0.10 per pound per minute or 10 minutes per pound.

Stage 2 (final) elapsed time. 40 minutes.

Total time 43 minutes.

Example No. 2:

5-hour working period at 24 pounds gage.

Decompression Table No. 1:

24 pounds for 5 hours, total decompression time. 117 minutes.

Decompression Table No. 2:

Stage 1: Reduce pressure from 24 pounds to 8 pounds at the uniform rate of 5 pounds per minute.

Elapsed time stage 1: 16/5 3 minutes.

Stage 2: Reduce pressure at a uniform rate from 8 pounds to 4 pounds over a period of 4 minutes. Rate, 1 pound per minute elapsed time, stage 2 4 minutes.

Transfer person to special decompression chamber maintaining the 4-pound pressure during the transfer operation.

Stage 3 (final stage): In the special decompression chamber, reduce the pressure at a uniform rate from 4 pounds to 0-pound gage over a period of 110 minutes. Rate, 0.037 pound per minute or 27.5 minutes per pound. Stage 3 (final) elapsed time 110 minutes.

Total time 117 minutes.

DECOMPRESSION TABLE NO. 1

TABLE DECOMPRESSION TIME

Work pressure p.s.i.g.	Working period hours											
	1/2	1	1 1/2	2	3	4	5	6	7	8	Over 8	
0-12 ..	3	3	3	3	3	3	3	3	3	3	3	3
14	6	6	6	6	6	6	6	6	16	16	33	
16	7	7	7	7	7	7	17	33	48	48	62	
18	7	7	7	8	11	17	48	63	73	87	87	
20	7	7	8	15	15	43	63	73	83	103	113	
22	9	9	16	24	38	68	93	103	113	128	133	
24	11	12	23	27	52	92	117	122	127	137	151	
26	13	14	29	34	69	104	126	141	142	142	163	
28	15	23	31	41	98	127	143	153	153	165	183	
30	17	28	38	62	105	143	165	168	178	188	204	
32	19	35	43	85	126	163	178	193	203	213	226	
34	21	39	58	98	151	178	195	218	223	233	248	
36	24	44	63	113	170	198	223	233	243	253	273	
38	28	49	73	128	178	203	223	238	253	263	278	
40	31	49	84	143	183	213	233	248	258	278	288	
42	37	56	102	144	189	215	245	260	263	268	293	
44	43	64	118	154	199	234	254	264	269	269	293	
46	44	74	139	171	214	244	269	274	289	299	318	
48	51	89	144	189	229	269	299	309	319	319	...	
50	58	94	164	209	249	279	309	329	...	...	...

DECOMPRESSION TABLE NO. 2

(Do not interpolate, use next higher value for conditions not computed.)

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				
			Pressure reduction P.s.i.g.		Time in stage Minutes Min/Pound	Pressure reduction rate	Total time decompress Minutes
			From	To			
14	1/2	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	1	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	1 1/2	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	2	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	3	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	4	1	14	0	2	0.20	6
		2	4	0	4	1.00	6
	5	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	6	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	7	1	14	4	2	0.20	6
		2	4	0	14	3.50	16
	8	1	14	4	2	0.20	6
		2	4	0	14	3.50	16
	Over 8	1	14	4	2	0.20	6
		2	4	0	30	7.50	32
16	1/2	1	16	4	3	0.20	7
		2	4	0	4	1.00	7
	1	1	16	4	3	0.20	7
		2	4	0	4	1.00	7
	1 1/2	1	16	4	3	0.20	7
		2	4	0	4	1.00	7
	2	1	16	4	3	0.20	7
		2	4	0	4	1.00	7
	3	1	16	4	3	0.20	7
		2	4	0	4	1.00	7
	4	1	14	4	3	0.20	7

Decompression data

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Pressure reduction P.s.i.g.		Time in stage Minutes Min/Pound	Pressure reduction rate	Total time decompress Minutes
			From	To			
						4	0	4	1.00	7
	5	1	14	4	4	0.20	7
		2	4	0	4	3.50	17
	6	1	14	4	3	0.20	7
		2	4	0	30	7.50	33
	7	1	14	4	3	0.20	7
		2	4	0	45	11.25	48
	8	1	14	4	3	0.20	7
		2	4	0	45	11.25	48
	Over 8	1	14	4	3	0.20	7
		2	4	0	60	15.00	63
18	1/2	1	18	4	3	0.20	7
		2	4	0	4	1.00	7
	1	1	18	4	3	0.20	7
		2	4	0	4	1.00	7
	1 1/2	1	18	4	3	0.20	7
		2	4	0	4	1.00	7
	2	1	18	4	3	0.20	7
		2	4	0	5	1.25	8
	3	1	18	4	3	0.20	7
		2	4	0	8	2.00	11
	4	1	18	4	3	0.20	7
		2	4	0	14	3.50	17
	5	1	18	4	3	0.20	7
		2	4	0	45	11.25	48
	6	1	18	4	3	0.20	7
		2	4	0	60	15.00	63
	7	1	18	4	3	0.20	7
		2	4	0	60	15.00	63
	8	1	18	4	3	0.20	7
		2	4	0	70	17.50	73
	Over 8	1	18	4	3	0.20	7
		2	4	0	84	21.00	87
20	1/2	1	20	4	3	0.20	7
		2	4	0	4	1.00	7
	1	1	20	4	3	0.20	7
		2	4	0	4	1.00	7
	1 1/2	1	20	4	3	0.20	7
		2	4	0	5	1.25	8
	2	1	20	4	3	0.20	7
		2	4	0	12	3.00	15
	3	1	20	4	3	0.20	7
		2	4	0	12	3.00	15
	4	1	20	4	3	0.20	7
		2	4	0	40	10.00	43
	5	1	20	4	3	0.20	7
		2	4	0	60	15.00	63
	6	1	20	4	3	0.20	7
		2	4	0	70	17.50	73
	7	1	20	4	3	0.20	7
		2	4	0	80	20.00	83
	8	1	20	4	3	0.20	7
		2	4	0	100	25.00	103
	Over 8	1	20	4	3	0.20	7
		2	4	0	110	27.50	113
22	1/2	1	22	6	3	0.20	7
		2	6	0	6	1.00	9
	1	1	22	6	3	0.20	7
		2	6	0	6	1.00	9
	1 1/2	1	22	6	3	0.20	7
		2	6	0	13	2.20	16
	2	1	22	6	3	0.20	7
		2	6	0	21	3.50	24
	3	1	22	6	3	0.20	7
		2	6	0	35	5.85	38
	4	1	22	6	3	0.20	7
		2	6	0	65	10.83	68
	5	1	22	6	3	0.20	7
		2	6	0	90	15.00	93

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				Total time decompress Minutes
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	
			From	To			
	6	1	22	6	3	0.20	
		2	6	0	100	16.67	103
	7	1	22	6	3	0.20	
		2	6	0	110	18.35	113
	8	1	22	6	3	0.20	
		2	6	0	125	20.80	128
	Over 8	1	22	6	3	0.20	
		2	6	0	130	21.70	133
24	1/2	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	4	1.00	11
	1	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	5	1.25	12
	1 1/2	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	16	4.00	23
	2	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	20	5.00	27
	3	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	45	11.25	52
	4	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	85	21.25	92
	5	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	110	27.50	117
	6	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	115	28.80	122
	7	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	120	30.00	127
	8	1	24	8	3	0.20	
		2	8	4	4	1.00	
		3	4	0	130	32.50	137
	Over 8	1	24	8	3	0.20	
		2	8	4	8	2.00	
		3	4	0	140	35.00	151
26	1/2	1	26	10	3	0.20	
		2	10	4	6	1.00	
		3	4	0	4	1.00	13
	1	1	26	10	3	0.20	
		2	10	4	6	1.00	
		3	4	0	5	1.25	14
	1 1/2	1	26	10	3	0.20	
		2	10	4	6	1.00	
		3	4	0	20	5.00	29
	2	1	26	10	3	0.20	
		2	10	4	6	1.00	
		3	4	0	25	6.25	34
	3	1	26	10	3	0.20	
		2	10	4	6	1.00	
		3	4	0	60	15.00	69
	4	1	26	10	3	0.20	
		2	10	4	6	1.00	
		3	4	0	95	23.75	104
	5	1	26	10	3	0.20	
		2	10	4	8	1.33	
		3	4	0	115	28.80	126
	6	1	26	10	3	0.20	
		2	10	4	8	1.33	
		3	4	0	130	32.50	141
	7	1	26	10	3	0.20	
		2	10	4	9	1.50	
		3	4	0	130	32.50	142
	8	1	26	10	3	0.20	

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				Total time decompress Minutes
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	
			From	To			
		2	10	4	9	1.50	
		3	4	0	130	32.50	142
	Over 8	1	26	10	3	0.20	
		2	10	4	30	5.00	
		3	4	0	130	32.50	163
28	1/2	1	28	12	3	0.20	
		2	12	4	8	1.00	
		3	4	0	4	1.00	15
	1	1	28	12	3	0.20	
		2	12	4	8	1.00	
		3	4	0	12	3.00	23
	1 1/2	1	28	12	3	0.20	
		2	12	4	8	1.00	
		3	4	0	20	5.00	31
	2	1	28	12	3	0.20	
		2	12	4	8	1.00	
		3	4	0	30	7.50	41
	3	1	28	12	3	0.20	
		2	12	4	10	1.25	
		3	4	0	85	21.20	98
	4	1	28	12	3	0.20	
		2	12	4	14	1.75	
		3	4	0	110	27.50	127
	5	1	28	12	3	0.20	
		2	12	4	20	2.50	
		3	4	0	120	30.00	143
	6	1	28	12	3	0.20	
		2	12	4	20	2.50	
		3	4	0	130	32.50	153
	7	1	28	12	3	0.20	
		2	12	4	20	2.50	
		3	4	0	130	32.50	153
	8	1	28	12	3	0.20	
		2	12	4	32	4.00	
		3	4	0	130	32.50	165
	Over 8	1	28	12	3	0.20	
		2	12	4	50	6.25	
		3	4	0	130	32.50	183
30	1/2	1	30	14	3	0.20	
		2	14	4	10	1.00	
		3	4	0	4	1.00	17
	1	1	30	14	3	0.20	
		2	14	4	10	1.00	
		3	4	0	15	3.75	28
	1 1/2	1	30	14	3	0.20	
		2	14	4	10	1.00	
		3	4	0	25	6.25	38
	2	1	30	14	3	0.20	
		2	14	4	14	1.40	
		3	4	0	45	11.25	62
	3	1	30	14	3	0.20	
		2	14	4	17	1.70	
		3	4	0	85	21.20	105
	4	1	30	14	3	0.20	
		2	14	4	30	3.00	
		3	4	0	110	27.50	143
	5	1	30	14	3	0.20	
		2	14	4	35	3.50	
		3	4	0	130	32.50	165
	6	1	30	14	3	0.20	
		2	14	4	35	3.50	
		3	4	0	130	32.50	168
	7	1	30	14	3	0.20	
		2	14	4	45	4.50	
		3	4	0	130	32.50	178
	8	1	30	14	3	0.20	
		2	14	4	55	5.50	
		3	4	0	130	32.50	188
	Over 8	1	30	14	3	0.20	

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				Total time decompress Minutes
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	
			From	To			
		2	14	4	71	7.10	
		3	4	0	130	32.50	204
32	1/2	1	32	16	3	0.20	
		2	16	4	12	1.00	
		3	4	0	4	1.00	19
	1	1	32	16	3	0.20	
		2	16	4	12	1.00	
		3	4	0	20	5.00	35
	1 1/2	1	32	16	3	0.20	
		2	16	4	15	1.25	
		3	4	0	25	6.25	43
	2	1	32	16	3	0.20	
		2	16	4	22	1.83	
		3	4	0	60	15.00	85
	3	1	32	16	3	0.20	
		2	16	4	28	2.33	
		3	4	0	95	23.75	126
	4	1	32	16	3	0.20	
		2	16	4	40	3.33	
		3	4	0	120	30.00	163
	5	1	32	16	3	0.20	
		2	16	4	45	3.75	
		3	4	0	130	32.50	178
	6	1	32	16	3	0.20	
		2	16	4	60	5.00	
		3	4	0	130	32.50	193
	7	1	32	16	3	0.20	
		2	16	4	70	5.83	
		3	4	0	130	32.50	203
	8	1	32	16	3	0.20	
		2	16	4	80	6.67	
		3	4	0	130	32.50	213
	Over 8	1	32	16	3	0.20	
		2	16	4	93	7.75	
		3	4	0	130	32.50	226
34	1/2	1	34	18	3	0.20	
		2	18	4	14	1.00	
		3	4	0	4	1.00	21
	1	1	34	18	3	0.20	
		2	18	4	14	1.00	
		3	4	0	22	5.50	39
	1 1/2	1	34	18	3	0.20	
		2	18	4	25	1.80	
		3	4	0	30	7.50	58
	2	1	34	18	3	0.20	
		2	18	4	35	2.50	
		3	4	0	60	15.00	98
	3	1	34	18	3	0.20	
		2	18	4	43	3.10	
		3	4	0	105	26.25	151
	4	1	34	18	3	0.20	
		2	18	4	55	3.93	
		3	4	0	120	30.00	178
	5	1	34	18	3	0.20	
		2	18	4	62	4.43	
		3	4	0	130	32.50	195
	6	1	34	18	3	0.20	
		2	18	4	85	6.07	
		3	4	0	130	32.50	218
	7	1	34	18	3	0.20	
		2	18	4	90	6.43	
		3	4	0	130	32.50	223
	8	1	34	18	3	0.20	
		2	18	4	100	7.15	
		3	4	0	130	32.50	233
	Over 8	1	34	18	3	0.20	
		2	18	4	115	8.23	
		3	4	0	130	32.50	248
36	1/2	1	36	20	3	0.20	

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				Total time decompress Minutes
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	
			From	To			
		2	20	4	16	1.00	
		3	4	0	5	1.25	24
	1	1	36	20	3	0.20	
		2	20	4	16	1.00	
		3	4	0	25	6.25	44
	1 1/2	1	36	20	3	0.20	
		2	20	4	30	1.88	
		3	4	0	30	7.50	63
	2	1	36	20	3	0.20	
		2	20	4	40	2.50	
		3	4	0	70	17.50	113
	3	1	36	20	3	0.20	
		2	20	4	52	3.25	
		3	4	0	115	28.75	170
	4	1	36	20	3	0.20	
		2	20	4	65	4.06	
		3	4	0	130	32.50	198
	5	1	36	20	3	0.20	
		2	20	4	90	5.63	
		3	4	0	130	32.50	223
	6	1	36	20	3	0.20	
		2	20	4	100	6.25	
		3	4	0	130	32.50	233
	7	1	36	20	3	0.20	
		2	20	4	110	6.88	
		3	4	0	130	32.50	243
	8	1	36	20	3	0.20	
		2	20	4	120	7.50	
		3	4	0	130	32.50	253
	Over 8	1	36	20	3	0.20	
		2	20	4	140	8.75	
		3	4	0	130	32.50	273
38	1/2	1	38	22	3	0.20	
		2	22	6	16	1.00	
		3	6	0	9	1.50	28
	1	1	38	22	3	0.20	
		2	22	6	16	1.00	
		3	6	0	30	5.00	49
	1 1/2	1	38	22	3	0.20	
		2	22	6	20	1.25	
		3	6	0	50	8.34	73
	2	1	38	22	3	0.20	
		2	22	6	30	1.88	
		3	6	0	95	15.83	128
	3	1	38	22	3	0.20	
		2	22	6	35	2.19	
		3	6	0	140	23.35	178
	4	1	38	22	3	0.20	
		2	22	6	50	3.12	
		3	6	0	150	25.00	203
	5	1	38	22	3	0.20	
		2	22	6	55	3.44	
		3	6	0	165	27.50	223
	6	1	28	22	3	0.20	
		2	22	6	70	4.38	
		3	6	0	165	27.50	238
	7	1	38	22	3	0.20	
		2	22	6	85	5.32	
		3	6	0	165	27.50	253
	8	1	38	22	3	0.20	
		2	22	6	95	5.93	
		3	6	0	165	27.50	263
	Over 8	1	38	22	3	0.20	
		2	22	6	110	6.88	
		3	6	0	165	27.50	278
40	1/2	1	40	24	3	0.20	
		2	24	8	16	1.00	
		3	8	4	4	1.00	
		4	4	0	8	2.00	31

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	Total time decompress Minutes
			From	To				Min/Pound
1	1	1	40	24	3	0.20	
		2	24	8	16	1.00	
		3	8	4	5	1.25	
		4	4	0	25	6.25	49
1 1/2	1	1	40	24	3	0.20	
		2	24	8	16	1.00	
		3	8	4	20	5.00	
		4	4	0	45	11.25	84
2	1	1	40	24	3	0.20	
		2	24	8	25	1.56	
		3	8	4	20	5.00	
		4	4	0	95	23.75	143
3	1	1	40	24	3	0.20	
		2	24	8	30	1.88	
		3	8	4	30	7.50	
		4	4	0	120	30.00	183
4	1	1	40	24	3	0.20	
		2	24	8	45	2.81	
		3	8	4	35	8.75	
		4	4	0	130	32.50	213
5	1	1	40	24	3	0.20	
		2	24	8	47	2.94	
		3	8	4	53	13.25	
		4	4	0	130	32.50	233
6	1	1	40	24	3	0.20	
		2	24	8	55	3.44	
		3	8	4	60	15.00	
		4	4	0	130	32.50	248
7	1	1	40	24	3	0.20	
		2	24	8	65	4.06	
		3	8	4	60	15.00	
		4	4	0	130	32.50	258
8	1	1	40	24	3	0.20	
		2	24	8	75	4.70	
		3	8	4	60	15.00	
		4	4	0	130	32.50	268
Over 8	1	1	40	24	3	0.20	
		2	24	8	95	5.93	
		3	8	4	60	15.00	
		4	4	0	130	32.50	288
42	1/2	1	42	26	3	0.20	
		2	26	10	16	1.00	
		3	10	4	6	1.00	
		4	4	0	12	3.00	37
1	1	1	42	26	3	0.20	
		2	26	10	16	1.00	
		3	10	4	12	2.00	
		4	4	0	25	6.25	56
1 1/2	1	1	42	26	3	0.20	
		2	26	10	16	1.00	
		3	10	4	23	3.83	
		4	4	0	60	15.00	102
2	1	1	42	26	3	0.20	
		2	26	10	16	1.00	
		3	10	4	30	-5.00	
		4	4	0	95	23.75	144
3	1	1	42	26	3	0.20	
		2	26	10	16	1.00	
		3	10	4	50	8.34	
		4	4	0	120	30.00	189
4	1	1	42	26	3	0.20	
		2	26	10	17	1.06	
		3	10	4	65	10.83	
		4	4	0	130	32.50	215
5	1	1	42	26	3	0.20	
		2	26	10	27	1.69	
		3	10	4	85	14.18	
		4	4	0	130	32.50	245
6	1	1	42	26	3	0.20	

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	Total time decompress Minutes
			From	To				Min/Pound
		2	26	10	27	1.69	
		3	10	4	100	16.67	
		4	4	0	130	32.50	260
7	1	1	42	26	3	0.20	
		2	26	10	30	1.88	
		3	10	4	100	16.67	
		4	4	0	130	32.50	263
8	1	1	42	26	3	0.20	
		2	26	10	35	2.19	
		3	10	4	100	16.67	
		4	4	0	130	32.50	268
Over 8	1	1	42	26	3	0.20	
		2	26	10	60	3.75	
		3	10	4	100	16.67	
		4	4	0	130	32.50	293
44	1/2	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	8	1.00	
		4	4	0	16	4.00	43
1	1	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	20	2.50	
		4	4	0	25	6.25	64
1 1/2	1	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	27	3.38	
		4	4	0	72	18.00	118
2	1	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	40	5.00	
		4	4	0	95	23.75	154
3	1	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	60	7.50	
		4	4	0	120	30.00	199
4	1	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	85	10.62	
		4	4	0	130	32.50	234
5	1	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	105	13.13	
		4	4	0	130	32.50	254
6	1	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	115	14.38	
		4	4	0	130	32.50	264
7	1	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	120	15.00	
		4	4	0	130	32.50	269
8	1	1	44	28	3	0.20	
		2	28	12	16	1.00	
		3	12	4	120	15.00	
		4	4	0	130	32.50	269
Over 8	1	1	44	28	3	0.20	
		2	28	12	40	2.50	
		3	12	4	120	15.00	
		4	4	0	130	32.50	293
46	1/2	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	10	1.00	
		4	4	0	15	3.75	44
1	1	1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	25	2.50	
		4	4	0	30	7.50	74
1 1/2	1	1	46	30	3	0.20	
		2	30	14	16	1.00	

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				Total time decompress Minutes
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	
			From	To			
		3	14	4	35	3.50	
		4	4	0	85	21.20	139
2		1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	47	4.70	
		4	4	0	105	26.25	171
3		1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	65	6.50	
		4	4	0	130	32.50	214
4		1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	95	9.50	
		4	4	0	130	32.50	244
5		1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	120	12.00	
		4	4	0	130	32.50	269
6		1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	125	12.50	
		4	4	0	130	32.50	274
7		1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	140	14.00	
		4	4	0	130	32.50	289
8		1	46	30	3	0.20	
		2	30	14	16	1.00	
		3	14	4	150	15.00	
		4	4	0	130	32.50	299
Over 8		1	46	30	3	0.20	
		2	30	14	25	1.56	
		3	14	4	160	16.00	
		4	4	0	130	32.50	318
48	1/2	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	12	1.00	
		4	4	0	20	5.00	51
1		1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	35	2.92	
		4	4	0	35	8.75	89
1 1/2		1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	45	3.75	
		4	4	0	80	20.00	144
2		1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	60	5.00	
		4	4	0	110	27.50	189
3		1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	90	7.50	
		4	4	0	120	30.00	229
4		1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	120	10.00	
		4	4	0	130	32.50	269
5		1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	140	11.67	
		4	4	0	130	32.50	299
6		1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	160	13.33	
		4	4	0	130	32.50	309
7		1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	170	14.17	

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				Total time decompress Minutes
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	
			From	To			
		4	4	0	130	32.50	319
	8	1	48	32	3	0.20	
		2	32	16	16	1.00	
		3	16	4	170	14.17	
		4	4	0	130	32.50	319
50	1/2	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	14	1.00	
		4	4	0	25	6.25	58
	1	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	40	2.86	
		4	4	0	35	8.75	94
	1 1/2	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	55	3.93	
		4	4	0	90	22.50	164
	2	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	70	5.00	
		4	4	0	120	30.00	209
	3	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	100	7.15	
		4	4	0	130	32.50	249
	4	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	130	8.58	
		4	4	0	130	32.50	279
	5	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	160	11.42	
		4	4	0	130	32.50	309
	6	1	50	34	3	0.20	
		2	34	18	16	1.00	
		3	18	4	180	12.85	
		4	4	0	130	32.50	329

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-155-74501, filed 7/20/94, effective 9/20/94; Order 74-26, § 296-155-745 (part), Appendix A (codified as WAC 296-155-74501), filed 5/7/74, effective 6/6/74.]

**PART R
MISCELLANEOUS CONSTRUCTION
REQUIREMENTS**

WAC 296-155-755 Roofing, insulating and water-proofing. (1) Roofers hoisting jack shall be constructed to withstand the contemplated load to be hoisted. The beam from counter balance point to heel of jack shall be at least 3/4 the length of the entire beam.

(2) Hoisting jack shall be counterweighted with a minimum of three times the contemplated maximum load to be lifted. Counterweight shall be securely fastened to heel of jack to prevent displacement, or the jack shall be fastened by means of lashing, bolting, or other means to prevent displacement.

(3) A steel collar or U-bolt and shackle on head of the hoisting jack shall be provided for attachment of pulley.

(4) Hoisting pulleys shall be of steel construction.

(5) Where materials are hoisted by hand the hoist line shall be not less than five-eighths manila rope, or the equivalent.

lent. Where machine hoist is used the hoist line shall be wire rope.

(6) Hoisting hooks shall be of cast or forged steel heavy enough to prevent straightening under a load.

(7) Workers shall not stand under load when material or hot asphalt is being hoisted.

(8) Hot asphalt shall be kept at a safe level in buckets for carrying and hoisting.

(9) Service buckets of hot asphalt shall not be carried up ladders by workers.

(10) Service buckets shall be standard safety bucket or flatbottom bucket with bails fastened to an offset ear firmly riveted to side of bucket. There shall be a handle riveted near bottom of bucket for tipping purposes.

(11) Ladders shall extend at least 3 feet above the platform or roof served and shall be secured at top and bottom to prevent slipping.

(12) Safeguards shall be erected to prevent loads and lines contacting power lines where not possible to work in clear of power lines.

(13) Asphalt chunks shall not be thrown into hot tar pot, but shall be placed so as to prevent splashing of hot material.

(14) There shall be means to smother fires at fired tar pots.

(15) Mop or spud bar handles over three feet long shall be of wood or other nonconductive material.

(16) Persons working at kettles or handling hot tar shall, wear gloves and have arms fully protected.

(17) Open tar heating pots shall be kept outside of buildings.

Note: Electric type tar heating equipment may be used inside of the working enclosure provided that exhaust fans in connection with tubing, either rigid or flexible, capable of carrying fumes created by the heating process to the outside air are installed and in constant use during heating operations. The equipment should be provided with hinged lid or baffle plate for the purpose of immediate smothering of a pot fire.

(18) While hot tar is being applied inside an enclosure, exhaust fans to supplement natural ventilation shall be installed to expedite removal of gaseous fumes from the building.

(19) Flame heated tar pots shall be prohibited on roofs of structures.

(20) Tar pots shall have an attendant at all times while in operation.

[Order 74-26, § 296-155-755, filed 5/7/74, effective 6/6/74.]

WAC 296-155-765 Rock crushing, gravel washing, and hot mix plants. (1) Stationary dragline machines shall have all moving parts which are exposed to contact guarded with standard safeguards.

(a) All running lines, straps, etc., shall be regularly inspected and shall be changed when 10% of the wires in a 3 foot length are broken.

(b) Spars shall be properly guyed with a minimum of 5 top guys and where spar is over 50 feet in height, 3 buckle guys shall be used.

(c) A pass line shall be rigged on the spar to provide safe means of reaching top of spar.

(d) The head block shall be equipped with a safety strap attached to shell of the block and onto a guy wire leading away from the working area.

(2) Truck dump bunkers shall have wheel bumper block installed when dumping material from trucks.

(3) Substantial walkways and working platforms, equipped with toe boards and handrails shall be installed at all plants. Standard stairways and ladders shall be placed to reach all parts requiring oiling and maintenance.

(4) Plant structures shall be constructed to carry the required load, without material or structural failure, for the prescribed life of the material used.

(5) Bunker unloading devices shall be arranged to be operative from outside the walls of bunkers.

(6) Crusher operators and other employees working where hazardous dust or nuisance dust exists shall use approved respirators and goggles.

(7) All dusty rock crushing houses or other dusty places of employment, shall be equipped with means for controlling the dust.

(8) Cone type crushers shall be equipped with approved guards over or around the feed end to prevent rock from flying from crusher while in operation.

(9) All aggregate elevators, bucket or other type, shall have guards or barricades installed under or around return strand and of sufficient strength to sustain weight of piled up broken elevator equipment.

(10) All plant controls shall be placed so as to be readily accessible.

(11) Overhead conveyors shall be constructed so as to restrain the spillage of material. Wherever the hazard of falling materials exists, overhead protection shall be provided over walkways and roadways.

(12) Electrical equipment shall be installed and maintained to comply with the National Electrical Code.

(13) Exhaust fumes from internal combustion engines shall be discharged away from or above the working station.

(14) Hot mix plants, steam boilers and pressure vessels shall conform to A.S.M.E. Boiler and Pressure Vessel Codes and applicable rules and regulations of the department.

(15) All hot pipes exposed to contact shall be covered or otherwise guarded against contact.

(16) All oil tanks above ground shall be properly bedded and grounded.

(17) Oil leakage on the ground shall be cleaned up or covered with absorbent material.

(18) Mixer operators shall use approved respirator and goggles except when operating from a remote location.

(19) Dust and fume collection systems shall be provided on all installations. Dust and fumes shall be discharged back into plant or carried to a suitable distance from the work area and precipitated.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-765, filed 1/21/86; Order 74-26, § 296-155-765, filed 5/7/74, effective 6/6/74.]

WAC 296-155-770 Moving of structures. (1) When structures are being raised, lowered, temporarily held in position or moved laterally, care shall be exercised to prevent the possibility of mishap.

(2) Weights to be moved shall be carefully computed and equipment furnished to provide a safety factor of five.

(3) Where excavations exist they shall be shored in compliance with Part N of this chapter.

(4) Cribbing and blocking shall be set on a level and firm foundation.

(5) Dollies and rollers shall be securely blocked except when structure is being moved by power equipment.

(6) Jacks shall comply with WAC 296-155-375 of this chapter.

(7) Provisions shall be made to maintain a minimum clearance of 10 feet from all electrical conductors with the following exceptions:

(a) When a representative of the owner of the electrical conductors is present and directs the handling of all said conductors.

(b) Where there shall be existing and/or erected mechanical barriers to prevent contact of structure or workers with said electrical conductors. Barriers shall be installed by or under the direction of the owners of the conductors.

(c) Where said electrical conductors have been de-energized and grounded by the owners of the conductors.

(d) By relocation of said electrical conductors by the owners of the conductors. The 10 foot requirement shall not be reduced by movement due to strains being imposed upon the conductors or the structures supporting the conductors or upon any fixtures or attachments thereon.

(8) When a structure is being lifted, shoring shall be provided at all times and be kept up to the object until the desired height is reached, and then it shall be blocked or cribbed immediately.

(9) Timbers must be in sound condition and of a size sufficient to maintain not more than one inch deflection for each 200 inches of unsupported span.

(10) The cross member used on the front dolly, or the fifth wheel on the truck, must be of construction and size to preclude any deflection. All floor joists of the building being moved must be firmly supported on either the running members or on the cross members, which in turn ride on or are firmly attached to the running members.

(11) When timbers are used as the cross member, a steel saddle or cradle shall be used which will distribute the load evenly over the cross members, which in turn ride on or are firmly attached to the running members.

(12) When timbers are used as the cross member, a steel saddle or cradle shall be used which will distribute the load evenly over the cross sectional area of said timber where the timber is supported over the dolly or fifth wheel. This saddle or cradle shall be equipped so as to be interchangeable on any standard fifth wheel when such operation is used. Cross members of any other material used on fifth wheel loading shall also be so equipped.

(13) When running members are secured to the lower side of the cross member supported by the fifth wheel or front dolly, the primary support shall be 3/4 inch steel bolts placed one on either side of each member and spaced from such members by 1/2 inch steel plate shaped to act as a template for placement on the top of the cross member and beneath the running member. 3/4 by 3" nuts shall be used to tighten the above described clamp in a secure fashion. A secondary bind-

ing of chain or cable with chain binder or jacks shall be used to securely fasten the running members to cross members.

Note: Chains or cables securely tightened can be used. A secondary chain or safety chain should also be used in the event that the main chain should snap.

(14) Safety chains shall be used between the running members and the towing truck to supplant the tow bar, and will be secured so as to preclude any possibility of the running timbers being pulled off the cross members on the truck or from the dollies.

(15) For the purpose of computing weights to determine the axle and tire loadings, the cubic volume of the building (length, width and height), including walls, floors and ceiling joists, shall be used, allowing five pounds per cubic foot. This method of computing weight shall be used to determine if larger equipment need be employed on any given move.

(16) When fastening structures to tractor, and runners are clamped to headers, steel chains or the equivalent shall be used. If steel chains are used, said chains shall be tightened by railroad jacks or the equivalent.

(17) All motor vehicles shall conform with motor vehicle laws of the state of Washington.

(18) A fifth wheel type suspension with two nonsteering dollies shall be acceptable for moving buildings which do not exceed 46 feet in length. Permission to move larger structures with this type of suspension shall be obtained from the department.

(19) Pushing from the rear shall be prohibited unless a system of signals is used to control the driver.

(20) Blocks capable of holding the unit being moved shall be carried, and in case of winching operations, shall be kept close to the downhill side of the wheel of each dolly to prevent a runaway should the cable slip.

[Order 74-26, § 296-155-770, filed 5/7/74, effective 6/6/74.]

PART S DEMOLITION

WAC 296-155-775 Preparatory operations. (1) Prior to permitting employees to start demolition operations, an engineering survey shall be made, by a competent person, of the structure to determine structural integrity and the possibility of unplanned collapse of any portion of the structure. Any adjacent structure where employees may be exposed shall also be similarly checked. The employer shall have in writing, evidence that such a survey has been performed.

(2) A copy of the survey report and of the plans and/or methods of operations shall be maintained at the job site for the duration of the demolition operation.

(3) Any device or equipment such as scaffolds, ladders, derricks, hoists, etc., used in connection with demolition work shall be constructed, installed, inspected, maintained and operated in accordance with the regulations governing the construction, installation, inspection, maintenance and operation of such device or equipment as specified in other parts of this chapter.

(4) Federal and state codes, safety standards, rules, regulations, and ordinances governing any and all phases of demolition work shall be observed at all times.

(5) Demolition of all buildings and structures shall be conducted under competent supervision, and safe working conditions shall be afforded the employees.

(6) When employees are required to work within a structure to be demolished which has been damaged by fire, flood, explosion, or other cause, the walls or floor shall be shored or braced.

(7) All electric, gas, water, steam, sewer, and other service lines shall be shut off, capped, or otherwise controlled, outside the building line before demolition work is started. In each case, any utility company which is involved shall be notified in advance.

(8) If it is necessary to maintain any power, water or other utilities during demolition, such lines shall be temporarily relocated, as necessary, and protected.

(9) It shall be determined whether asbestos, hazardous materials, hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances are present at the work site. When the presence of any such substance is apparent or suspected, testing and removal or purging shall be performed and the hazard eliminated before demolition is started. Removal of such substances shall be in accordance with the requirements of chapters 296-62 and 296-65 WAC.

(10) Where a hazard exists from fragmentation of glass, such hazards shall be removed.

(11) Where a hazard exists to employees falling through wall openings, the opening shall be protected to a height of between thirty-six and forty-two inches.

(12) When debris is dropped without the use of chutes, the area onto which the material is dropped shall be completely enclosed with barricades not less than forty-two inches high and not less than twenty feet back from the projected edge of the opening above. Signs, warning of the hazard of falling materials, shall be posted at each level. Removal shall not be permitted in this lower area until debris handling ceases above.

(13) All floor openings, not used as material drops, shall be covered over with material substantial enough to support the weight of any load which may be imposed. Such material shall be properly secured to prevent its accidental movement.

(14) Except for the cutting of holes in floors for chutes, holes through which to drop materials, preparation of storage space, and similar necessary preparatory work, the demolition of exterior walls and floor construction shall begin at the top of the structure and proceed downward. Each story of exterior wall and floor construction shall be removed and dropped into the storage space before commencing the removal of exterior walls and floors in the story next below.

(15) Workers shall not be permitted to carry on a demolition operation which will expose persons working on a lower level to danger.

(16) Employee entrances to multistory structures being demolished shall be completely protected by sidewalk sheds or canopies, or both, providing protection from the face of the building for a minimum of eight feet. All such canopies shall be at least two feet wider than the building entrances or openings (one foot wider on each side thereof), and shall be capable of sustaining a load of one hundred fifty pounds per square foot.

(17) Protruding nails in boards, planks and timber shall be withdrawn, driven in or bent over as soon as the same is removed from the structure being demolished.

(18) Any material to be removed which will cause dust to be formed, shall be sprinkled with water to lay the dust incidental to its removal.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-775, filed 7/20/94, effective 9/20/94; 87-24-051 (Order 87-24), § 296-155-775, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-775, filed 4/27/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-775, filed 1/21/86; Order 74-26, § 296-155-775, filed 5/7/74, effective 6/6/74.]

WAC 296-155-780 Stairs, passageways, and ladders.

(1) Only those stairways, passageways, and ladders, designated as means of access to the structure of building, shall be used. Other access ways shall be entirely closed off at all times.

(2) All stairs, passageways, ladders and incidental equipment thereto, which are covered by this section, shall be periodically inspected and maintained in a clean safe condition.

(3) All ladders shall be secured in position.

(4) In a multistory building, when a stairwell is being used, it shall be properly illuminated by either natural or artificial means, and completely and substantially covered over at a point not less than two floors below the floor on which work is being performed. Access to the floor where the work is in progress shall be through a properly lighted, protected, and separate passageway.

[Order 74-26, § 296-155-780, filed 5/7/74, effective 6/6/74.]

WAC 296-155-785 Chutes. (1) No material shall be dropped to any point lying outside the exterior walls of the structure unless the area is effectively protected.

(2) All materials chutes, or sections thereof, at an angle of more than 45° from the horizontal, shall be entirely enclosed, except for openings equipped with closures at or about floor level for the insertion of materials. The openings shall not exceed 48 inches in height measured along the wall of the chute. At all stories below the top floor, such openings shall be kept closed when not in use.

(3) A substantial gate shall be installed in each chute at or near the discharge end. A competent employee shall be assigned to control the operation of the gate, and the backing and loading of trucks.

(4) When operations are not in progress, the area surrounding the discharge end of a chute shall be securely closed off.

(5) Any chute opening, into which workers dump debris, shall be protected by a substantial guardrail between 36 and 42 inches above the floor or other surface on which the employees stand to dump the material. Any space between the chute and the edge of openings in the floors through which it passes shall be solidly covered over.

(6) Where the material is dumped from mechanical equipment or wheelbarrows, a securely attached toeboard or bumper, not less than 4 inches thick and 6 inches high, shall be provided at each chute opening.

(7) Chutes shall be designed and constructed of such strength as to eliminate failure due to impact of materials or debris loaded therein.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-785, filed 7/20/94, effective 9/20/94; Order 74-26, § 296-155-785, filed 5/7/74, effective 6/6/74.]

WAC 296-155-790 Removal of materials through floor openings. Any openings cut in a floor for the disposal of materials shall be no larger in size than 25 percent of the aggregate of the total floor area, unless the lateral supports of the removed flooring remain in place. Floors weakened or otherwise made unsafe by demolition operations shall be shored to carry safely the intended imposed load from demolition operations.

[Order 74-26, § 296-155-790, filed 5/7/74, effective 6/6/74.]

WAC 296-155-795 Removal of walls, masonry sections, and chimneys. (1) Masonry walls, or other sections of masonry, shall not be permitted to fall upon the floors of the building in such masses as to exceed the safe carrying capacities of the floors.

(2) No wall section, which is more than one story in height, shall be permitted to stand alone without lateral bracing, unless such wall was originally designed and constructed to stand without such lateral support, and is in a condition safe enough to be self-supporting. All walls shall be left in a stable condition at the end of each shift.

(3) Employees shall not be permitted to work on the top of a wall when weather conditions constitute a hazard.

(4) Structural or load-supporting members on any floor shall not be cut or removed until all stories above such a floor have been demolished and removed. This provision shall not prohibit the cutting of floor beams for the disposal of materials or for the installation of equipment, provided that the requirements of WAC 296-155-790 and 296-155-800 are met.

(5) Floor openings within 10 feet of any wall being demolished shall be planked solid, except when employees are kept out of the area below.

(6) In buildings of "skeleton-steel" construction, the steel framing may be left in place during the demolition of masonry. Where this is done, all steel beams, girders, and similar structural supports shall be cleared of all loose material as the masonry demolition progresses downward.

(7) Walkways or ladders shall be provided to enable employees to safely reach or leave any scaffold or wall.

(8) Walls, which serve as retaining walls to support earth or adjoining structures, shall not be demolished until such earth has been properly braced or adjoining structures have been properly underpinned.

(9) Walls, which are to serve as retaining walls against which debris will be piled, shall not be so used unless capable of safely supporting the imposed load.

[Order 74-26, § 296-155-795, filed 5/7/74, effective 6/6/74.]

WAC 296-155-800 Manual removal of floors. (1) Openings cut in a floor shall extend the full span of the arch between supports.

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(2) Before demolishing any floor arch, debris and other material shall be removed from such arch and other adjacent floor area. Planks not less than 2 inches by 10 inches in cross section, full size undressed, shall be provided for, and shall be used by employees to stand on while breaking down floor arches between beams. Such planks shall be so located as to provide a safe support for the workers should the arch between the beams collapse. The open space between planks shall not exceed 16 inches.

(3) Safe walkways, not less than 18 inches wide, formed of planks not less than 2 inches thick if wood, or of equivalent strength if metal, shall be provided and used by workers when necessary to enable them to reach any point without walking upon exposed beams.

(4) Stringers of ample strength shall be installed to support the flooring planks, and the ends of such stringers shall be supported by floor beams or girders, and not by floor arches alone.

(5) Planks shall be laid together over solid bearings with the ends overlapping at least 1 foot.

(6) When floor arches are being removed, employees shall not be allowed in the area directly underneath, and such an area shall be barricaded to prevent access to it.

(7) Demolition of floor arches shall not be started until they, and the surrounding floor area for a distance of 20 feet, have been cleared of debris and any other unnecessary materials.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-800, filed 7/20/94, effective 9/20/94; Order 74-26, § 296-155-800, filed 5/7/74, effective 6/6/74.]

WAC 296-155-805 Removal of walls, floors, and material with equipment. (1) Mechanical equipment shall not be used on floors or working surfaces unless such floors or surfaces are of sufficient strength to support the imposed load.

(2) Floor openings shall have curbs or stop-logs to prevent equipment from running over the edge.

(3) Mechanical equipment used shall meet the requirements specified in parts L and M of this chapter.

[Order 74-26, § 296-155-805, filed 5/7/74, effective 6/6/74.]

WAC 296-155-810 Catch platforms. (1) During the demolition of the exterior walls of a structure originally more than seventy feet high, catch platforms shall be erected along the exterior faces of such walls where necessary to prevent injury to persons working below.

(2) Such catch platforms shall be constructed and maintained not more than three stories below the story from which the exterior walls are being removed, until the demolition has progressed to within three stories of the ground level.

(3) Catch platforms shall not be less than five feet in width measured in a horizontal distance from the face of the structure and constructed of outriggers and planks. Planks shall be laid tight together and without openings between the planks and the wall.

Note: Catch platforms may be constructed of other approved materials of equal strength and security against falling material.

(4) Catch platforms shall be capable of sustaining a uniform live load of not less than one hundred and twenty-five pounds per square foot.

[Order 74-26, § 296-155-810, filed 5/7/74, effective 6/6/74.]

WAC 296-155-815 Storage. (1) The storage of waste material and debris on any floor shall not exceed the allowable floor loads.

(2) In buildings having wooden floor construction, the flooring boards may be removed from not more than one floor above grade to provide storage space for debris, provided falling material is not permitted to endanger the stability of the structure.

(3) When wood floor beams serve to brace interior walls or free-standing exterior walls, such beams shall be left in place until other equivalent support can be installed to replace them.

(4) Floor arches, to an elevation of not more than 25 feet above grade, may be removed to provide storage area for debris: Provided, That such removal does not endanger the stability of the structure.

(5) Storage space into which material is dumped shall be blocked off, except for openings necessary for the removal of material. Such openings shall be kept closed at all times when material is not being removed.

[Order 74-26, § 296-155-815, filed 5/7/74, effective 6/6/74.]

WAC 296-155-820 Removal of steel construction. (1) When floor arches have been removed, planking in accordance with WAC 296-155-800(2) shall be provided for the workers engaged in razing the steel framing.

(2) Cranes, derricks, and other hoisting equipment used shall meet the requirements specified in part L of this chapter.

(3) Steel construction shall be dismantled column length by column length, and tier by tier (columns may be in two-story lengths).

(4) Any structural member being dismembered shall not be overstressed.

[Order 74-26, § 296-155-820, filed 5/7/74, effective 6/6/74.]

WAC 296-155-825 Mechanical demolition. (1) No workers shall be permitted in any area, which can be adversely affected by demolition operations, when balling or clamming is being performed. Only those workers necessary for the performance of the operations shall be permitted in this area at any other time.

(2) The weight of the demolition ball shall not exceed 50 percent of the crane's rated load, based on the length of the boom and the maximum angle of operation at which the demolition ball will be used, or it shall not exceed 25 percent of the nominal breaking strength of the line by which it is suspended, whichever results in a lesser value.

(3) The crane boom and loadline shall be as short as possible.

(4) The ball shall be attached to the loadline with a swivel-type connection to prevent twisting of the loadline, and shall be attached by positive means in such manner that the weight cannot become accidentally disconnected.

(5) When pulling over walls or portions thereof, all steel members affected shall have been previously cut free.

[Title 296 WAC—p. 2360]

(6) All roof cornices or other such ornamental stonework shall be removed prior to pulling walls over.

(7) During demolition, continuing inspections by a competent person shall be made as the work progresses to detect hazards resulting from weakened or deteriorated floors, or walls, or loosened material. No employee shall be permitted to work where such hazards exist until they are corrected by shoring, bracing, or other effective means.

[Order 74-26, § 296-155-825, filed 5/7/74, effective 6/6/74.]

WAC 296-155-830 Selective demolition by explosives. Selective demolition by explosives shall comply with chapter 296-52 WAC.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-830, filed 1/21/86; Order 74-26, § 296-155-830, filed 5/7/74, effective 6/6/74.]

PART U POWER DISTRIBUTION AND TRANSMISSION LINES

(RESERVED)

Refer to chapter 296-44 WAC, "Safety standards for electrical construction work."

PART V ROLLOVER PROTECTIVE STRUCTURES AND OVERHEAD PROTECTION

WAC 296-155-950 Rollover protective structures (ROPS) for material handling equipment. (1) Coverage.

(a) This section applies to the following types of material handling equipment: To all rubber-tired, self-propelled scrapers, rubber-tired front-end loaders, rubber-tired dozers, wheel-type agricultural and industrial tractors, crawler tractors, crawler-type loaders, and motor graders, with or without attachments, that are used in construction work. This requirement does not apply to sideboom pipelaying tractors.

(b) The promulgation of specific standards for rollover protective structures for compactors and rubber-tired skid-steer equipment is reserved pending consideration of standards currently being developed.

(2) Equipment manufactured on or after September 1, 1972, Material handling machinery described in subsection (1) of this section and manufactured on or after September 1, 1972, shall be equipped with rollover protective structures which meet the minimum performance standards prescribed in WAC 296-155-955 and 296-155-960, as applicable.

(3) Equipment manufactured before September 1, 1972.

(a) All material handling equipment described in subsection (1) of this section and manufactured or placed in service (owned or operated by the employer) prior to September 1, 1972, shall be fitted with rollover protective structures.

Machines manufactured before July 1, 1969; Reserved pending further study, development, and review.

(b) Rollover protective structures and supporting attachment shall meet the minimum performance criteria detailed in WAC 296-155-955 and 296-155-960, as applicable or

(1999 Ed.)

shall be designed, fabricated, and installed in a manner which will support, based on the ultimate strength of the metal, at least two times the weight of the prime mover applied at the point of impact.

(i) The design objective shall be to minimize the likelihood of a complete overturn and thereby minimize the possibility of the operator being crushed as a result of a rollover or upset.

(ii) The design shall provide a vertical clearance of at least 52 inches from the work deck to the ROPS at the point of ingress or egress.

(4) Remounting. ROPS removed for any reason, shall be remounted with equal quality, or better, bolts or welding as required for the original mounting.

(5) Labeling. Each ROPS shall have the following information permanently affixed to the structure:

(a) Manufacturer or fabricator's name and address;

(b) ROPS model number, if any;

(c) Machine make, model, or series number that the structure is designed to fit.

(6) Machines meeting certain existing governmental requirements. Any machine in use, equipped with rollover protective structures, shall be deemed in compliance with this section if it meets the rollover protective structures requirements of the U.S. Army Corps of Engineers, or the Bureau of Reclamation of the U.S. Department of the Interior in effect on April 5, 1972. The requirements in effect are:

(a) U.S. Army Corps of Engineers: General Safety Requirements, EM-385-1-1 (March 1967).

(b) Bureau of Reclamation, U.S. Department of the Interior: Safety and Health Regulations for Construction, Part II (September 1971).

(7) ROPS meeting the criteria set forth in SAE J1040 a and SAE J1040 b shall be regarded as substantially meeting the requirements of this section, even if they do not meet all the criteria set forth in earlier criteria documents on which the present standard is based.

[Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-155-950, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-950, filed 1/21/86; Order 76-29, § 296-155-950, filed 9/30/76; Order 74-26, § 296-155-950, filed 5/7/74, effective 6/6/74.]

WAC 296-155-955 Minimum performance criteria for rollover protective structures for designated scrapers, loaders, dozers, graders, and crawler tractors. (1) Definitions. For purposes of this section, "vehicle weight" means the manufacturer's maximum weight of the prime mover for rubber-tired self-propelled scrapers. For other types of equipment to which this section applies, "vehicle weight" means the manufacturer's maximum recommended weight of the vehicle plus the heaviest attachment.

(2) General.

(a) This section prescribes minimum performance criteria for rollover protective structures (ROPS) for rubber-tired self-propelled scrapers; rubber-tired front-end loaders and rubber-tired dozers; crawler tractors, and crawler-type loaders, and motor graders. The vehicle and ROPS as a system shall have the structural characteristics prescribed in subsection (7) of this section for each type of machine described in this subsection.

(1999 Ed.)

(b) Equipment listed in subsection (2)(a) of this section may be exempted from the requirements for fitment of ROPS where it can be shown, to the satisfaction of the department, that the equipment will only be used where no rollover hazard will exist.

(3) The static laboratory test prescribed herein will determine the adequacy of the structures used to protect the operator under the following conditions:

(a) For rubber-tired self-propelled scrapers, rubber-tired front-end loaders, and rubber-tired dozers: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to a maximum roll angle of 360° down a slope of 30° maximum.

(b) For motor graders: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to 360° down a slope of 30° maximum.

(c) For crawler tractors and crawler-type loaders: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to a maximum roll angle of 360° down a slope of 45°.

(4) Facilities and apparatus.

(a) The following material is necessary:

(i) Material, equipment, and tiedown means adequate to ensure that the ROPS and its vehicle frame absorb the applied energy.

(ii) Equipment necessary to measure and apply loads to the ROPS. Adequate means to measure deflection and lengths should also be provided.

(iii) Recommended, but not mandatory, types of test setups are illustrated in Figure V-1 for all types of equipment to which this section applies; and in Figure V-2 for rubber-tired self-propelled scrapers; Figure V-3 for rubber-tired front-end loaders, rubber-tired dozers, and motor graders; and Figure V-4 for crawler tractors and crawler-type loaders.

(b) Table V-1 contains a listing of the required apparatus for all types of equipment described in subsection (2)(a) of this section.

TABLE V-1

Means to measure	Accuracy
Deflection of ROPS, inches	± 5% of deflection measured.
Vehicle weight, pounds	± 5% of the weight measured.
Force applied to frame, pounds	± 5% of force measured.
Dimensions of critical zone, inches.	± 0.5 in.

(5) Vehicle condition. The ROPS to be tested must be attached to the vehicle structure in the same manner as it will be attached during vehicle use. A totally assembled vehicle is not required. However, the vehicle structure and frame which support the ROPS must represent the actual vehicle installation. All normally detachable windows, panels, or nonstructural fittings shall be removed so that they do not contribute to the strength of the ROPS.

(6) Test procedure. The test procedure shall include the following, in the sequence indicated:

(a) Energy absorbing capabilities of ROPS shall be verified when loaded laterally by incrementally applying a distributed load to the longitudinal outside top member of the ROPS, as shown in Figure V-1, V-2 or V-3 as applicable. The distributed load must be applied so as to result in approximately uniform deflection of the ROPS. The load increments should correspond with approximately 0.5 in. ROPS deflection increment in the direction of the load application, measured at the ROPS top edge. Should the operator's seat be off center, the load shall be applied on the off center side. For each applied load increment, the total load (lb.) versus corresponding deflection (in.) shall be plotted, and the area under the load-deflection curve shall be calculated. This area is equal to the energy (in.-lb.) absorbed by the ROPS. For a typical load-deflection curve and calculation method, see Figure V-5.

Incremental loading shall be continued until the ROPS has absorbed the amount of energy and the minimum applied load specified under subsection (7) of this section has been reached or surpassed.

(b) To cover the possibility of the vehicle coming to rest on its top, the support capability shall be verified by applying a distributed vertical load to the top of the ROPS so as to result in approximately uniform deflection (see Figure V-1). The load magnitude is specified in subsection (7)(b)(iii) of this section.

(c) The low temperature impact strength of the material used in the ROPS shall be verified by suitable material tests or material certification (see subsection (7)(b)(iv) of this section).

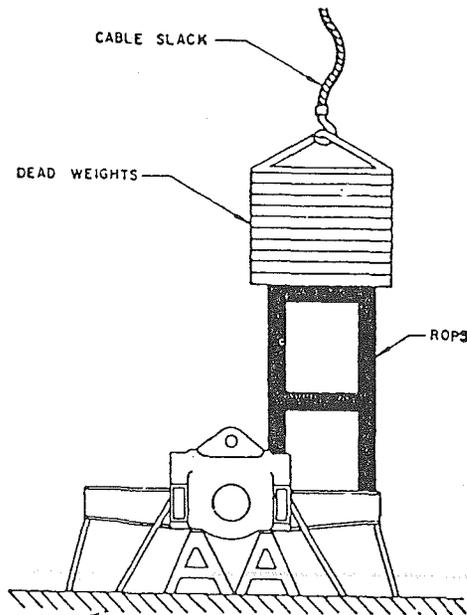


FIGURE V-1

Vertical loading setup for all types of equipment described in WAC 296-155-955(1).

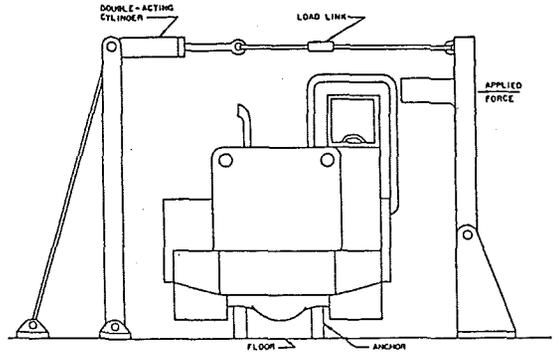


FIGURE V-2

Test setup for rubber-tired self-propelled scrapers.

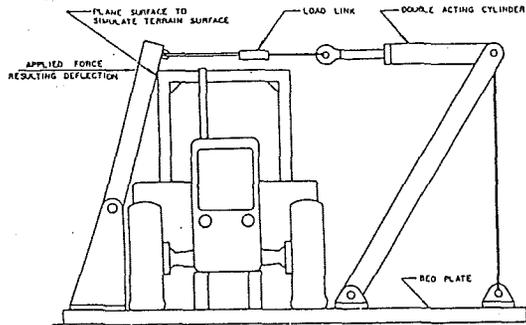


FIGURE V-3

Test setup for rubber-tired front-end loaders, rubber-tired dozers, and motor graders.

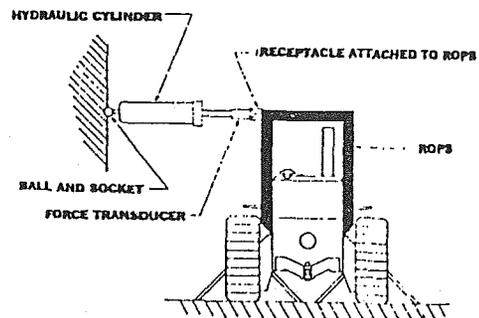
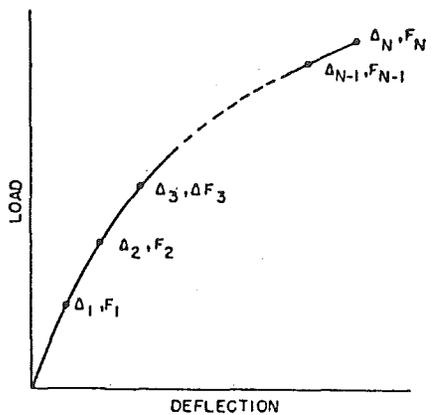


FIGURE V-4

Side-loading setup for crawler tractors and crawler loaders.



Δ - TOTAL DEFLECTION
F - FORCE APPLIED

$$\text{AREA} = \frac{\Delta_1 F_1}{2} + (\Delta_2 - \Delta_1) \frac{F_1 + F_2}{2} + (\Delta_3 - \Delta_2) \frac{F_2 + F_3}{2} + \dots + (\Delta_N - \Delta_{N-1}) \frac{F_{N-1} + F_N}{2}$$

FIGURE V-5

Determination of energy area under force deflection curve for all types of ROPS equipment defined in WAC 296-155-955.

(7) Performance requirements.

(a) General performance requirements.

(i) No repairs or straightening of any member shall be carried out between each prescribed test.

(ii) During each test, no part of the ROPS shall enter the critical zone as detailed in SAE J397 (1969). Deformation of the ROPS shall not allow the plane of the ground to enter this zone.

(b) Specific performance requirements.

(i) The energy requirement for purposes of meeting the requirements of subsection (6)(a) of this section is to be determined by referring to the plot of the energy versus weight of vehicle (see Figure V-6 for rubber-tired self-propelled scrapers; Figure V-7 for rubber-tired front-end loaders and rubber-tired dozers; Figure V-8 for crawler tractors and crawler-type loaders; and Figure V-9 for motor graders. For purposes of this section, force and weight are measured as pounds; energy (U) is measured as inch-pounds).

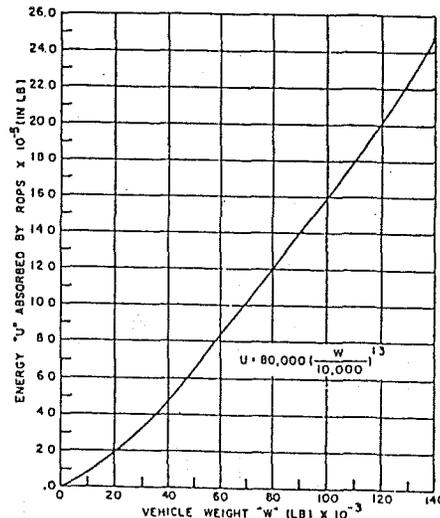


FIGURE V-6

Energy absorbed versus vehicle weight.

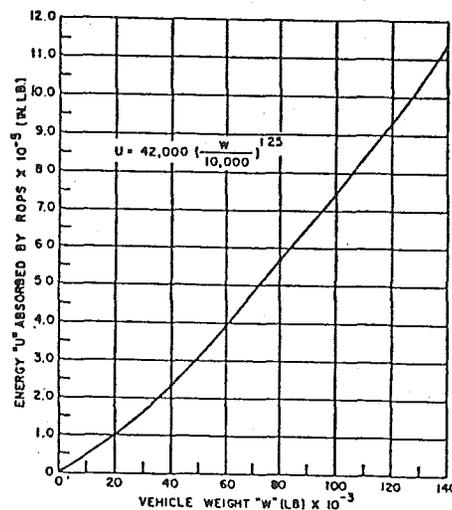


FIGURE V-7

Energy absorbed versus vehicle weight.

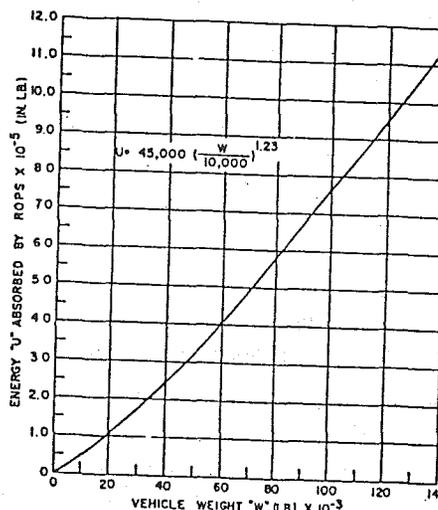


FIGURE V-8

Energy absorbed versus vehicle weight.

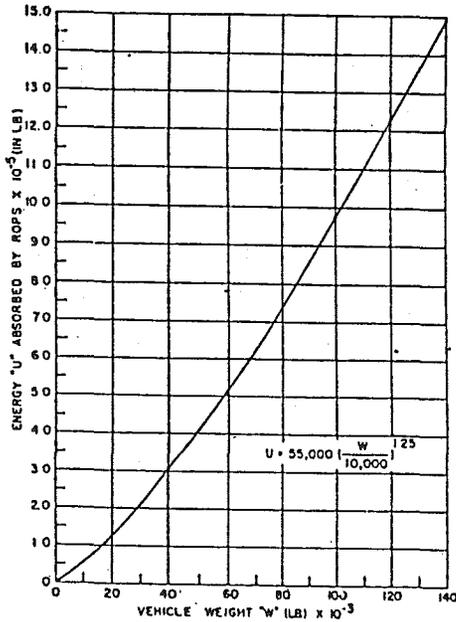


FIGURE V-9
Energy absorbed versus vehicle weight.

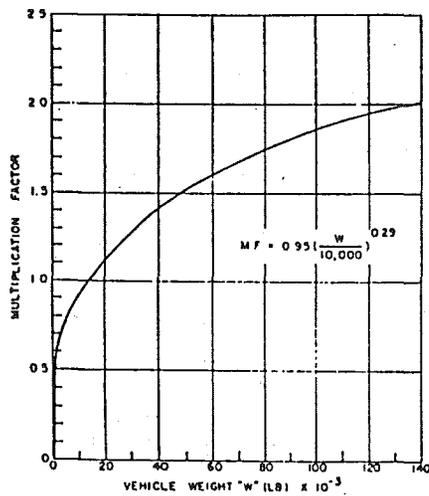


FIGURE V-10
Minimum horizontal load factor for self-propelled scrapers.

(ii) The applied load must attain at least a value which is determined by multiplying the vehicle weight by the corresponding factor shown in Figure V-10 for rubber-tired self-propelled scrapers; in Figure V-11 for rubber-tired front-end loaders and rubber-tired dozers; in Figure V-12 for crawler tractors and crawler-type loaders; and in Figure V-13 for motor graders.

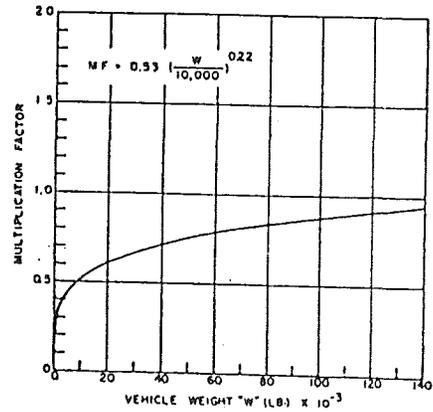


FIGURE V-11
Minimum horizontal load factor for rubber-tired loaders and dozers.

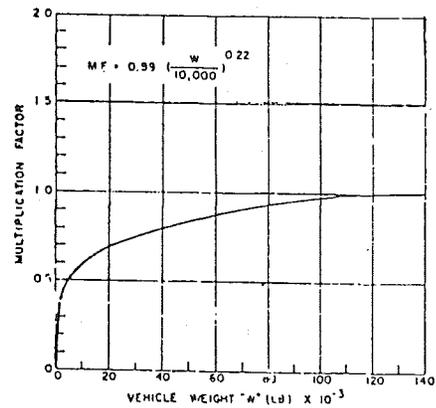


FIGURE V-12
Minimum horizontal load factor for crawler tractors and crawler-type loaders.

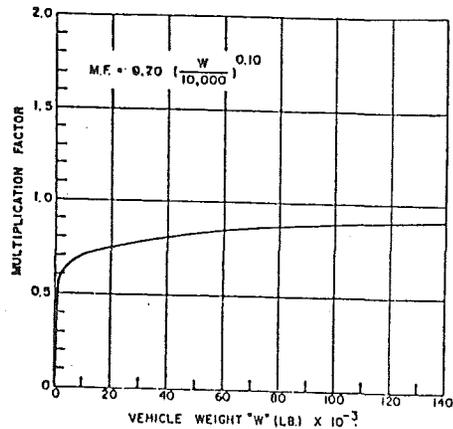


FIGURE V-13
Minimum horizontal load factor for motor graders.

(iii) The load magnitude for purposes of compliance with subsection (6)(b) of this section is equal to the vehicle weight. The test of load magnitude shall only be made after the requirements of subdivision (b)(i) of this subsection are met.

(iv) Material used in the ROPS must have the capability of performing at zero degrees Fahrenheit, or exhibit Charpy V notch impact strength of 8 foot-pounds at minus 20° Fahrenheit. This is a standard Charpy specimen as described in American Society of Testing and Materials A 370, Methods and Definitions for Mechanical Testing of Steel Products. The purpose of this requirement is to reduce the tendency of brittle fracture associated with dynamic loading, low temperature operation, and stress raisers which cannot be entirely avoided on welded structures.

(8) Source of standard. This standard is derived from, and restates, the following Society of Automotive Engineers Recommended Practices: SAE J320a, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired, Self-Propelled Scrapers; SAE J394, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired Front-End Loaders and Rubber-Tired Dozers; SAE J395, Minimum Performance Criteria for Roll-Over Protective Structure for Crawler Tractors and Crawler-Type Loaders; and SAE J396, Minimum Performance Criteria for Roll-Over Protective Structure for Motor Graders. These recommended practices shall be resorted to in the event that questions of interpretation arise. The recommended practices appear in the 1971 SAE Handbook, which may be examined in each of the district offices of the department of labor and industries.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-955, filed 7/20/94, effective 9/20/94; Order 74-26, § 296-155-955, filed 5/7/74, effective 6/6/74.]

WAC 296-155-960 Protective frame (ROPS) test procedures and performance requirements for wheel-type agricultural and industrial tractors used in construction.

(1) Definitions applicable to this section.

(a) SAE J333a, Operator Protection for Wheel-Type Agricultural and Industrial Tractors (July 1970) defines "agricultural tractor" as a "wheel-type vehicle of more than 20 engine horsepower designed to furnish the power to pull, carry, propel, or drive implements that are designed for agricultural usage." Since this chapter applies only to construction work, the following definition of "agricultural tractor" is adopted for purposes of this part: "Agricultural tractor" means a wheel-type vehicle of more than 20 engine horsepower, used in construction work, which is designed to furnish the power to pull, propel, or drive implements.

(b) "Industrial tractor" means that class of wheeled type tractor of more than 20 engine horsepower (other than rubber-tired loaders and dozers described in WAC 296-155-955), used in operations such as landscaping, construction services, loading, digging, grounds keeping, and highway maintenance.

(c) The following symbols, terms, and explanations apply to this section:

- E_{is} = Energy input to be absorbed during side loading. $E_{is} = 723 + 0.4 W$ ft.-lb. ($E'_{is} = 100 + 0.12 W'$, m.-kg).
- E_{ir} = Energy input to be absorbed during rear loading. $E_{ir} = 0.47 W$ ft.-lb. ($E'_{ir} = 0.14 W'$, m.-kg).
- W = Tractor weight as prescribed in WAC 296-155-960 (5)(a) and (5)(c) in lb. (W' , kg).
- L = Static load, lb. (kg.).
- D = Deflection under L , in. (mm.).
- $L-D$ = Static load-deflection diagram.
- L_m-D_m = Modified static load-deflection diagram (Figure V-20). To account for increase in strength due to increase in strain rate, raise L in plastic range to $L \times K$.
- K = Increase in yield strength induced by higher rate of loading (1.3 for hot rolled low carbon steel 1010-1030). Low carbon is preferable; however, if higher carbon or other material is used, K must be determined in the laboratory. Refer to Charles H. Norris, et al., Structural Design for Dynamic Loads (1959), p. 3.
- L_{max} = Maximum observed static load.
- Load limit = Point on $L-D$ curve where observed static load is $0.8 L_{max}$ (refer to Figure V-19).
- E_u = Strain energy absorbed by the frame, ft.-lb. (m.-kg) area under L_m-D_m curve.
- FER = Factor of energy ratio, $FER = E_u/E_{is}$; also = E_u/E_{ir}
- P_b = Maximum observed force in mounting connection under static load, L , lb. (kg.).
- FSB = Design margin for mounting connection $FSB = (P_u/P_b)-1$.
- H = Vertical height of lift of 4,410 lb. (2,000 kg.) weight, in. (H' , mm.). The weight shall be pulled back so that the height of its center of gravity above the point of impact is defined as follows: $H = 4.92 + 0.00190 W$ or ($H' = 125 + 0.107 W'$) (Figure V-14).

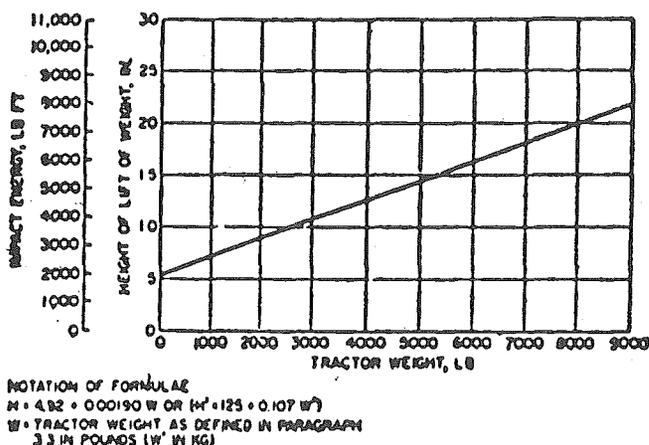


FIGURE V-14
Impact energy and corresponding lift height of 4,410 lb. (2,000 kg.) weight.

(ii) Source of standard. The standard in this section is derived from, and restates, Society of Automotive Engineers Standard J334a (July 1970), Protective Frame Test Procedures and performance requirements. This standard shall be resorted to in the event that questions of interpretation arise. The standard appears in the 1971 SAE Handbook.

(2) General.

(a) The purpose of this section is to set forth requirements for frames for the protection of operators of wheel type agricultural and industrial tractors to minimize the possibility of operator injury resulting from accidental upsets during normal operation. With respect to agricultural and industrial tractors, the provisions of WAC 296-155-955 and 296-155-965 for rubber-tired dozers and rubber-tired loaders may be utilized in lieu of the requirements of this section.

(b) The protective frame which is the subject of this standard is a structure mounted to the tractor that extends above the operator's seat and conforms generally to Figure V-15.

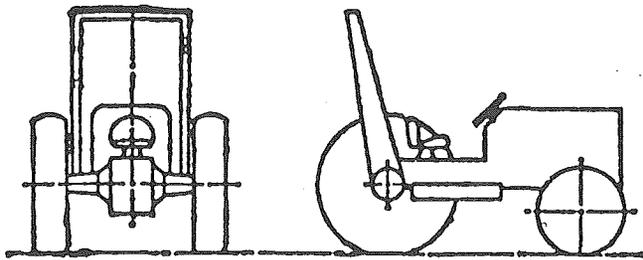


FIGURE V-15
Typical frame configuration.

(c) If an overhead weather shield is attached to the protective frame, it may be in place during tests: *Provided*, That it does not contribute to the strength of the protective frame. If such an overhead weather shield is attached, it must meet the requirements of subsection (10) of this section.

(d) For overhead protection requirements, see WAC 296-155-965.

(e) If protective enclosures are used on wheel-type agricultural and industrial tractors, they shall meet the requirements of Society of Automotive Engineers Standard J168 (July 1970), Protective Enclosures, Test Procedures, and performance requirements.

(3) Applicability. The requirements of this section apply to wheel-type agricultural tractors use in construction work and to wheel-type industrial tractors used in construction work. See subsection (1) of this section for definitions of agricultural tractors and industrial tractors.

(4) Performance requirements.

(a) Either a laboratory test or a field test is required in order to determine the performance requirements set forth in subsection (10) of this section.

(b) A laboratory test may be either static or dynamic. The laboratory test must be under conditions of repeatable and controlled loading in order to permit analysis of the protective frame.

(c) A field upset test, if used, shall be conducted under reasonably controlled conditions, both rearward and sideways, to verify the effectiveness of the protective frame under actual dynamic conditions.

(5) Test procedure—General.

(a) The tractor used shall be the tractor with the greatest weight on which the protective frame is to be used.

(b) A new protective frame and mounting connections of the same design shall be used for each test procedure.

(c) Instantaneous and permanent frame deformation shall be measured and recorded for each segment of the test.

(d) Dimensions relative to the seat shall be determined with the seat unloaded and adjusted to its highest and most rearward latched position provided for a seated operator.

(e) If the seat is offset, the frame loading shall be on the side with the least space between the centerline of the seat and the upright.

(f) The low temperature impact strength of the material used in the protective structure shall be verified by suitable material tests or material certifications in accordance with WAC 296-155-955 (7)(b)(iv).

(6) Test procedure for vehicle overturn.

(a) Vehicle weight. The weight of the tractor, for purposes of this section, includes the protective frame, all fuels, and other components required for normal use of the tractor. Ballast must be added if necessary to achieve a minimum total weight of 130 lb. (59 kg.) per maximum power takeoff horsepower at rated engine speed. The weight of the front end must be at least 33 lb. (15 kg.) per maximum power takeoff horsepower. In case power takeoff horsepower is unavailable, 95 percent of net engine flywheel horsepower shall be used.

(b) Agricultural tractors shall be tested at the weight set forth in subdivision (a) of this subsection.

(c) Industrial tractors shall be tested with items of integral or mounted equipment and ballast that are sold as standard equipment or approved by the vehicle manufacturer for use with the vehicle where the protective frame is expected to provide protection for the operator with such equipment installed. The total vehicle weight and front end weight as tested shall not be less than the weights established in subdivision (a) of this subsection.

(d) The test shall be conducted on a dry, firm soil bank as illustrated in Figure V-16. The soil in the impact area shall have an average cone index in the 0.6 in. (153 mm.) layer not less than 150 according to American Society of Agricultural Engineers Recommendations ASAE R313, Soil Cone Penetrometer. The path of travel of the vehicle shall be $12^\circ \pm 2^\circ$ to the top edge of the bank.

(e) The upper edge of the bank shall be equipped with an 18 in. (457 mm.) high ramp as described in Figure V-16 to assist in tipping the vehicle.

(f) The front and rear wheel tread settings, where adjustable, shall be at the position nearest to halfway between the minimum and maximum settings obtainable on the vehicle. Where only two settings are obtainable, the minimum setting shall be used.

(g) Vehicle overturn test—Sideways and rearward.

(i) The tractor shall be driven under its own power along the specified path of travel at a minimum speed of 10 m.p.h. (16 km./hr.) or maximum vehicle speed if under 10 m.p.h. (16 km./hr.) up the ramp as described in subdivision (e) of this subsection to induce sideways overturn.

(iii) The protective frame and mounting connections shall be instrumented with the necessary recording equipment to obtain the required load-deflection data to be used in calculating FSB (see subsection (1)(c) of this section). The gauges shall be placed on mounting connections before the installation load is applied.

(b) Test procedure.

(i) The side load application shall be at the upper extremity of the frame upright at a 90° angle to the centerline of the vehicle. The side load "L" shall be applied according to Figure V-17. "L" and "D" shall be recorded simultaneously. The test shall be stopped when:

(a) The strain energy absorbed by the frame is equal to the required input energy (E_{is}) or

(b) Deflection of the frame exceeds the allowable deflection, or

(c) The frame load limit occurs before the allowable deflection is reached in the side load.

(ii) The L-D diagram, as shown by means of a typical example in Figure V-20, shall be constructed, using the data obtained in accordance with item (i) of this subdivision.

(iii) The modified L_m - D_m diagram shall be constructed according to item (ii) of this subdivision and according to Figure V-21. The strain energy absorbed by the frame (E_u) shall then be determined.

(iv) E_{is} , FER and FSB shall be calculated.

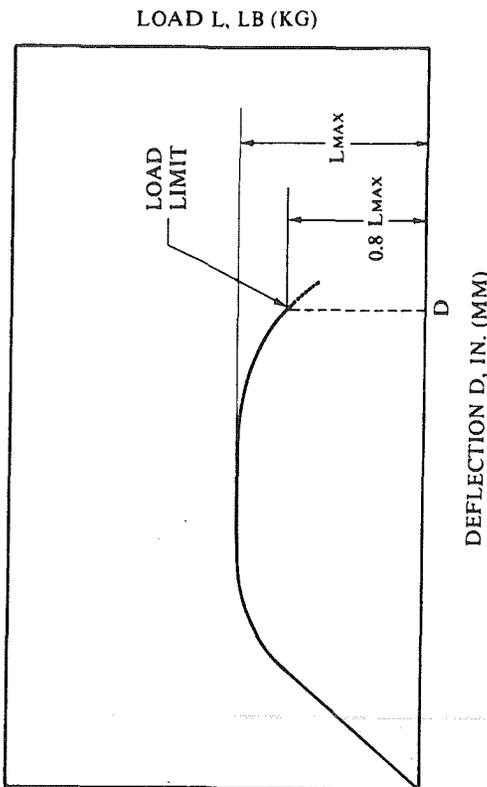


FIGURE V-20
Typical L-D diagram.

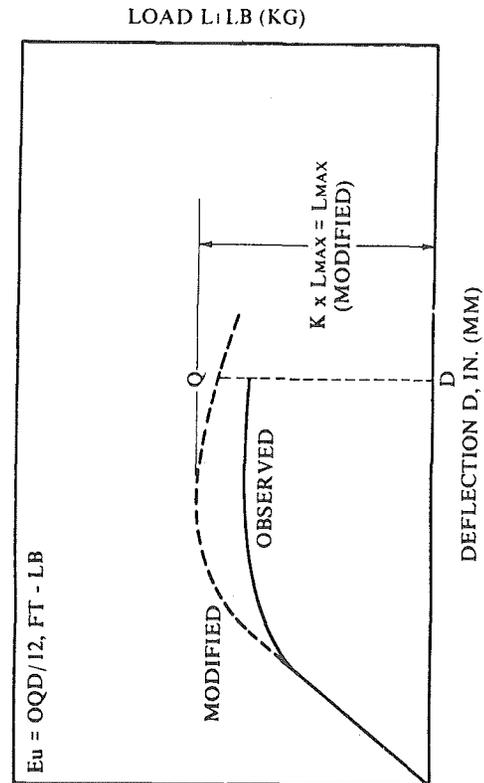


FIGURE V-21
Typical modified L_m - D_m diagram.

(v) The test procedure shall be repeated on the same frame utilizing L (rear input; see Figure V-19) and E_{ir} . Rear load application shall be uniformly distributed along a maximum projected dimension of 27 in. (686 mm.) and a maximum area of 160 sq. in. (1,032 sq. cm.) normal to the direction of load application. The load shall be applied to the upper extremity of the frame at the point which is midway between the centerline of the seat and the inside of the frame upright.

(9) Dynamic test.

(a) Test conditions.

(i) The protective frame and tractor shall meet the requirements of subsection (6)(b) or (c) of this section, as appropriate.

(ii) The dynamic loading shall be produced by use of a 4,410 lb. (2,000 kg.) weight acting as a pendulum. The impact face of the weight shall be 27 plus or minus 1 in. by 27 plus or minus 1 in. (686 + or - 25 mm.) and shall be constructed so that its center of gravity is within 1 in. (25.4 mm.) of its geometric center. The weight shall be suspended from a pivot point 18-22 ft. (5.5-6.7 m.) above the point of impact on the frame and shall be conveniently and safely adjustable for height. (See Figure V-22.)

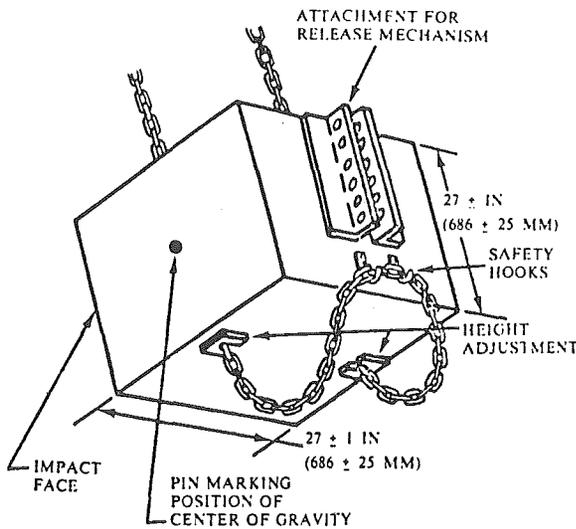


FIGURE V-22
Pendulum.

(iii) For each phase of testing, the tractor shall be restrained from moving when the dynamic load is applied. The restraining members shall be of 0.5-0.63 in. (12.5-16 mm.) steel cable and points of attaching restraining members shall be located an appropriate distance behind the rear axle and in front of the front axle to provide a 15°-30° angle between a restraining cable and the horizontal. The restraining member shall either be in the plane in which the center gravity of the pendulum will swing or more than one restraining cable shall give a resultant force in this plane. (See Figure V-23.)

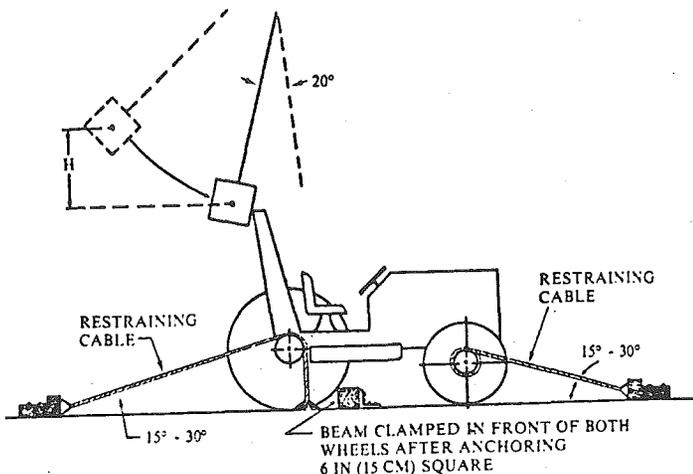


FIGURE V-23
Method of impact from rear.

(iv) The wheel tread setting shall comply with the requirements of subsection (6)(f) of this section. The tires shall have no liquid ballast and shall be inflated to the maximum operating pressure recommended by the tire manufacturer. With specified tire inflation, the restraining cables shall be tightened to provide tire deflection of 6-8 percent of nom-

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inal tire section width. After the vehicle is properly restrained, a wooden beam 6 x 6 in. (15 x 15 cm.) shall be driven tightly against the appropriate wheels and clamped. For the test to the side, an additional wooden beam shall be placed as a prop against the wheel nearest the operator's station and shall be secured to the floor so that it is held tightly against the wheel rim during impact. The length of this beam shall be chosen so that when it is positioned against the wheel rim it is at an angle of 25°-40° to the horizontal. It shall have a length 20-25 times its depth and a width two to three times its depth. (See Figures V-23 and V-24.)

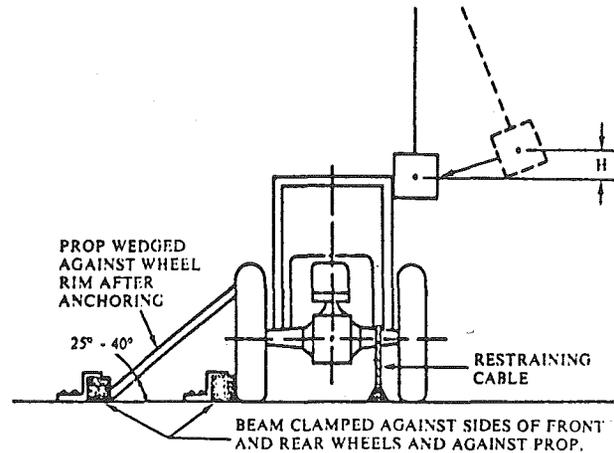


FIGURE V-24
Method of impact from side.

(v) Means shall be provided indicating the maximum instantaneous deflection along the line of impact. A simple friction device is illustrated in Figure V-24.

(vi) No repair or adjustments may be carried out during the test.

(vii) If any cables, props, or blocking shift or break during the test, the test shall be repeated.

(b) Test procedure.

(i) General. The frame shall be evaluated by imposing dynamic loading to rear followed by a load to the side on the same frame. The pendulum dropped from the height (see definition "H" in subsection (1)(c) of this section) imposes the dynamic load. The position of the pendulum shall be so selected that the initial point of impact on the frame shall be in line with the arc of travel of the center of gravity of the pendulum. A quick release mechanism should be used but, if used, shall not influence the attitude of the block.

(ii) Impact at rear. The tractor shall be properly restrained according to subdivisions (a)(iii) and (iv) of this section. The tractor shall be positioned with respect to the pivot point of the pendulum such that the pendulum is 20° from the vertical prior to impact, as shown in Figure V-23. The impact shall be applied to the upper extremity of the frame at the point which is midway between the centerline of the seat and the inside of the frame upright of a new frame.

(iii) Impact at side. The block and restraining shall conform to subdivisions (a)(iii) and (iv) of this subsection. The point of impact shall be that structural member of the protec-

tive frame likely to hit the ground first in a sideways accidental upset. The side impact shall be applied to the side opposite that used for rear impact.

(10) Performance requirements.

(a) General.

(i) The frame, overhead weather shield, fenders, or other parts in the operator area may be deformed but shall not shatter or leave sharp edges exposed to the operator, or violate dimensions as shown in Figures V-17 and V-18 as follows:

- D = 2 in. (51 mm.) inside of frame upright to vertical centerline of seat.
- E = 30 in. (762 mm.).
- F = Not less than 0 in. and not more than 12 in. (305 mm.), measured at centerline front of seat backrest to crossbar along the line of load application as shown in Figure V-17.
- G = 24 in. (610 mm.).

(ii) The material and design combination used in the protective structure must be such that the structure can meet all prescribed performance tests at zero degrees Fahrenheit in accordance with WAC 296-155-955 (7)(b)(iv).

(b) Vehicle overturn performance requirements. The requirements of this subsection (10) must be met in both side and rear overturns.

(c) Static test performance requirements. Design factors shall be incorporated in each design to withstand an overturn test as prescribed in this subsection (10). The structural requirements will be generally met if FER is greater than 1 and FSB is greater than K-1 in both side and rear loadings.

(d) Dynamic test performance requirements. Design factors shall be incorporated in each design to withstand the overturn test prescribed in this subsection (10). The structural requirements will be generally met if the dimensions in this subsection (10) are adhered to in both side and rear loads.

[Order 74-26, § 296-155-960, filed 5/7/74, effective 6/6/74.]

WAC 296-155-965 Overhead protection for operators of agricultural and industrial tractors. (1) General.

(a) Purpose. When overhead protection is provided on wheel-type agricultural and industrial tractors, the overhead protection shall be designed and installed according to the requirements contained in this section. The provisions of WAC 296-155-955 for rubber-tired dozers and rubber-tired loaders may be used in lieu of the standards contained in this section. The purpose of the standard is to minimize the possibility of operator injury resulting from overhead hazards such as flying and falling objects, and at the same time to minimize the possibility of operator injury from the cover itself in the event of accidental upset.

(b) Applicability. This section applies to wheel-type agricultural tractors used in construction work and to wheel-type industrial tractors used in construction work. See WAC 296-155-960 (1) and (3). In the case of machines to which WAC 296-155-625 (relating to site clearing) also applies, the overhead protection may be either the type of protection provided in WAC 296-155-625 or the type of protection provided by this section.

(2) Overhead protection. When overhead protection is installed on wheel-type agricultural or industrial tractors used

in construction work, it shall meet the requirements of this subsection. The overhead protection may be constructed of a solid material. If grid or mesh is used, the largest permissible opening shall be such that the maximum circle which can be inscribed between the elements of the grid or mesh is 1.5 in. (38 mm.) in diameter. The overhead protection shall not be installed in such a way as to become a hazard in the case of upset.

(3) Test procedures—General.

(a) The requirements of WAC 296-155-960 (5), (6) and (7) shall be met.

(b) Static and dynamic rear load application shall be uniformly distributed along a maximum projected dimension of 27 in. (686 mm.) and a maximum area of 160 in.² (1,032 cm.²) normal direction of load application. The load shall be applied to the upper extremity of the frame at the point which is midway between the centerline of the seat and the inside of the frame upright.

(c) The static and dynamic side load application shall be uniformly distributed along a maximum projected dimension of 27 in. (686 mm.) and a maximum area of 160 in.² (1,032 cm.²) normal to the direction of load application. The direction of load application is the same as in WAC 296-155-960 (8) and (9). To simulate the characteristics of the structure during an upset, the center of load application may be located from a point 24 in. (610 mm.) (K) forward to 12 in. (305 mm.) (K) forward to 12 in. (305 mm.) (L) rearward of the front of the seat backrest to best utilize the structural strength. See Figure V-25.

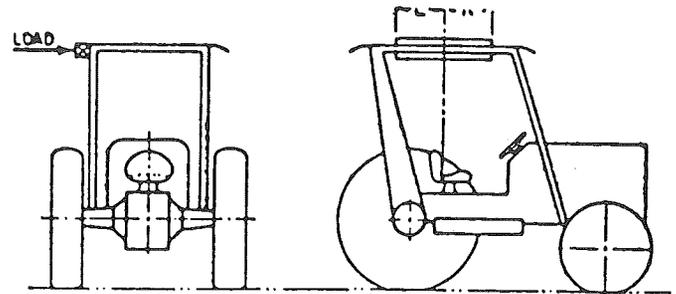


FIGURE V-25
Location for side load.

(4) Drop test procedures.

(a) The same frame shall be subjected to the drop test following either the static or dynamic test.

(b) A solid steel sphere or material of equivalent spherical dimension weighing 100 lb. (45.4 kg.) shall be dropped once from a height 10 ft. (3,048 mm.) above the overhead cover.

(c) The point of impact shall be on the overhead cover at a point within the zone of protection as shown in Figure V-26, which is furthest removed from major structural members.

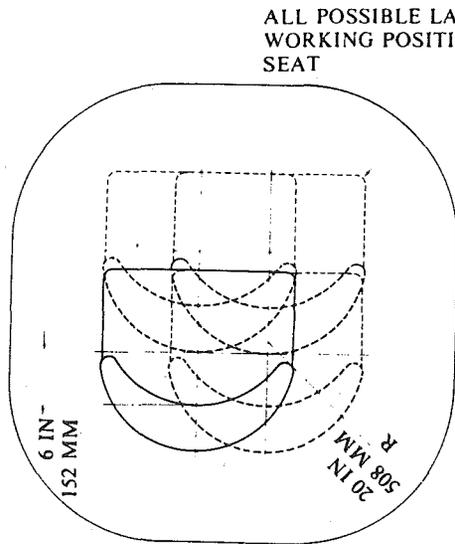


FIGURE V-26
Zone of protection for drop test.

(5) Crush test procedure.

(a) The same frame shall be subjected to the crush test following the drop test and static or dynamic test.

(b) The test load shall be applied as shown in Figure V-27 with the seat positioned as specified in WAC 296-155-960 (5)(d). Loading cylinders shall be pivotally mounted at both ends. Loads applied by each cylinder shall be equal within 2 percent, and the sum of the loads of the two cylinders shall be two times the tractor weight as set forth in WAC 296-155-960 (6)(a). The maximum width of the beam illustrated in Figure V-27 shall be 6 in. (152 mm.).

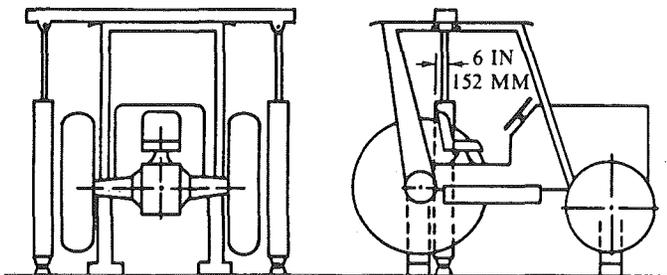


FIGURE V-27
Method of load application for crush test.

(6) Performance requirements.

(a) General. The performance requirements set forth in WAC 296-155-960 (10)(b), (c) and (d) shall be met.

(b) Drop test performance requirements.

(i) Instantaneous deformation due to impact of the sphere shall not enter the protected zone as illustrated in Figures V-25, V-26, and V-28.

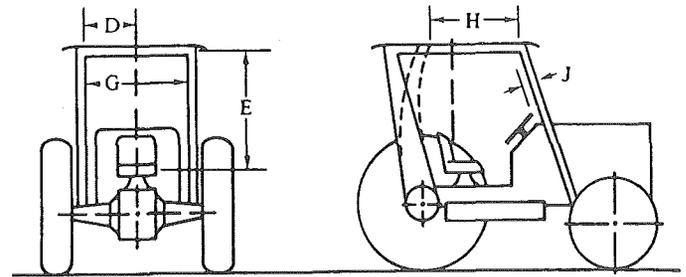


FIGURE V-28
Protected zone during crush and drop tests.

(ii) In addition to the dimensions set forth in WAC 296-155-960 (10)(a)(i) the following dimensions apply to Figure V-28:

H = 17.5 in. (444 mm.).

J = 2 in. (50.8 mm.) measured from the outer periphery of the steering wheel.

(c) Crush test performance requirements. The protected zone as described in Figure V-28 must not be violated.

(7) Source of standard. This standard is derived from, and restates, the portions of Society of Automotive Engineers Standard J167 which pertain to overhead protection requirements. The full title of the SAE standard is: Protective Frame with Overhead Protection—Test Procedures and performance requirements. The SAE standard shall be resorted to in the event that questions of interpretation arise. The SAE standard appears in the 1971 SAE Handbook.

[Order 74-26, § 296-155-965, filed 5/7/74, effective 6/6/74.]

Chapter 296-200A WAC

CONTRACTOR CERTIFICATE OF REGISTRATION RENEWALS—SECURITY—INSURANCE

WAC

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- 296-200A-015 What terms do I need to know to understand this chapter?
- 296-200A-025 How does a contractor register or renew its registration?
- 296-200A-035 How long is a contractor's registration period?
- 296-200A-040 How does a contractor's registration become suspended?
- 296-200A-050 What requirements must be met if a contractor changes its business structure, name or address?
- 296-200A-060 What procedures should be followed when surety bonds and insurance policies are canceled?
- 296-200A-070 When will the department refund a security deposit?
- 296-200A-080 How is a suit filed against a contractor?
- 296-200A-090 How are judgments against contractors paid?
- 296-200A-110 Is a city, town, or county required to verify a contractor registration number?
- 296-200A-111 How does a city, town, or county verify a contractor's registration?
- 296-200A-112 Who is liable when a city, town, or county fails to verify a contractor's registration?
- 296-200A-300 What violations of chapter 18.27 RCW can result in the issuance of a notice of infraction?
- 296-200A-305 How does the department notify registered contractors regarding any unregistered subcontractors they may employ?
- 296-200A-310 What information must be included in a notice of infraction?
- 296-200A-320 Who can be issued a notice of infraction?
- 296-200A-330 If a notice of infraction is served on an employee, how is the contractor notified?
- 296-200A-340 How does a contractor appeal a notice of infraction?

296-200A-350	Who presides over an appeal hearing and where is it held?
296-200A-360	Who will represent the contractor and the department at the appeal hearing?
296-200A-370	How is the appeal hearing conducted?
296-200A-380	What evidence is admissible in an appeal hearing?
296-200A-390	What does the department do with the appeal notices that they receive?
296-200A-400	What monetary penalties will be assessed for an infraction issued for violations of RCW 18.27.100, 18.27.114 or 18.27.200?
296-200A-405	When must a contractor pay assessed monetary penalties?
296-200A-500	Is the department required to monitor unregistered contractors who become registered?
296-200A-510	Is the department required to report contractor compliance activities to the legislature?
296-200A-900	What fees does the department charge contractors for issuance, renewal and reinstatement of certificates of registration?

WAC 296-200A-005 What is the goal of this chapter?

The goal of this chapter is to:

- (1) Reduce the paperwork required for contractor registrations.
- (2) Clarify issues related to suits against contractors and the collection of court judgments.
- (3) Ensure that the contractors registration law (chapter 18.27 RCW) is efficiently and properly administered.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-005, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-015 What terms do I need to know to understand this chapter? For the purposes of this chapter, the following terms and definitions are important:

"Administrative law judge" is any person appointed by the chief administrative law judge (as defined in RCW 34.12.020(2)) to preside at a notice of infraction appeal hearing convened under RCW 18.27.100, 18.27.114 or 18.27.200.

"Appeal hearing" is any proceeding in which an administrative law judge is empowered to determine legal rights, duties or privileges of specific parties on behalf of the director.

"Compliance inspector" refers to the departmental staff responsible for investigating potential violations of chapter 18.27 RCW.

"Contractor compliance chief" refers to the person designated by the director to address all policy and technical issues related to chapter 18.27 RCW and chapter 296-200A WAC.

"Department" refers to the department of labor and industries.

"Director" refers to the director of the department of labor and industries or the director's designee acting in the place of the director.

"Final judgment" means any money that is owed to a claimant as a result of court action against a contractor's bond or assigned savings account with the department or any money that is owed the department as a result of a contractor's unsuccessful appeal of an infraction. Final judgment also includes any penalties owed the department as a result of an unappealed infraction or any outstanding fees due under this chapter.

"Infraction" means a violation of RCW 18.27.100, 18.27.114 or 18.27.200 as cited by the chief contractor com-

pliance inspector or the department's construction compliance inspectors.

"Secured contractor" is a contractor who has complied with RCW 18.27.040 by assigning, to the department, a savings account held in a Washington state bank, depositing cash with the department or obtaining a surety bond.

"Security" is a savings account held in a Washington state bank and assigned to the department, cash deposited with the department or a surety bond.

"Unregistered contractor" means a person, firm, or corporation working as a contractor without being registered in compliance with chapter 18.27 RCW and chapter 296-200A WAC.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-015, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-025 How does a contractor register or renew its registration?

(1) A contractor may register if it:

- (a) Completes an application for contractor registration and submits it to the department as required by RCW 18.27.030;

(b) Satisfies one of the following:

(i) Obtains a surety bond and submits the original bond to the department (see RCW 18.27.040); or

(ii) Assigns, to the department, a savings account held in Washington state; or

(iii) Deposits cash with the department;

(c) Obtains public liability and property damage insurance and submits the original insurance certificate to the department (see RCW 18.27.050); and

(d) Pays the issuance/renewal/reregistration fee shown in WAC 296-200A-900.

(2) A contractor may renew its registration if it submits, to the department, a completed contractor registration renewal notice and the material required in subsection (1)(b) and (c) of this section and pays the renewal fee shown in WAC 296-200A-900. At least forty-five days before the contractor's registration expires, the department must send a renewal notice to the contractor's last recorded address. It is the responsibility of the contractor to notify the department **in writing** of a change in address.

(3) The contractor must:

(a) Submit all required materials to the department in one package.

(b) Include, on each material, its name exactly as it appears on the contractor registration application or renewal notice.

(c) Include, if renewing a registration, the contractor's registration number on each of the materials.

(4) The department will not register or renew the registration of a contractor if:

(a) Any of the required materials are missing;

(b) The materials do not properly name the contractor;

(c) The materials, in the case of a renewal, do not include the registration number; or

(d) The applicant has been previously registered as a contractor and has an unsatisfied final judgment based on chapter 18.27 RCW.

(5) The contractor may request, in a letter filed with the application or renewal materials, that the registration period

end on a particular day. However, the registration period cannot exceed one year.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-025, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-035 How long is a contractor's registration period? (1) A registration period cannot exceed one year.

(2) If a contractor's insurance policy will expire in less than one year after the day the registration begins, the registration period ends on the day the insurance expires.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-035, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-040 How does a contractor's registration become suspended? (1) A contractor's registration will be suspended if it does not comply with WAC 296-200A-025, specifically, if:

- (a) A surety bond or other security is impaired.
- (b) A surety bond is canceled.
- (c) An insurance policy is canceled.

(2) The contractor's registration will be automatically suspended on the effective date of the impairment or cancellation. The department must mail a notice of the suspension to the contractor's address on the certificate of registration by certified mail **and** first class mail within forty-eight hours after suspension.

(3) A contractor must not advertise, offer to do work, submit a bid, or perform any work as a contractor while its registration is suspended. To continue to operate as a contractor while its registration is suspended is a violation of chapter 18.27 RCW and subject to infractions.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-040, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-050 What requirements must be met if a contractor changes its business structure, name or address? (1) If a contractor changes its business structure (for example, from a partnership to a corporation or if the partners in a partnership change), the contractor must:

(a) Apply for a new registration as required in WAC 296-200A-025; and

(b) Pay the registration fee shown in WAC 296-200A-900.

(2) Failure to reregister after a change in business structure may invalidate the contractor's registration. See RCW 18.27.040.

(3) If a registered contractor changes its name, it must:

(a) Notify the department, in writing, of the change; and

(b) Pay the registration fee shown in WAC 296-200A-900; and

(c) Submit to the department a name change rider or a new bond in the new name and a certificate of insurance in the new name.

(4) If a registered contractor changes its address, it must notify the department in writing.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-050, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-060 What procedures should be followed when surety bonds and insurance policies are can-

celed? (1) Insurance and bonding companies should send cancellation notices to the department by certified or registered mail.

(2) Cancellation notices must contain the following information in the order shown:

(a) The name of the contractor exactly as it appears in the contractor's registration file;

(b) The contractor's registration number;

(c) The contractor's business address;

(d) The names of the owners, partners, or officers of the contractor;

(e) The bond or insurance policy number; and

(f) The effective date of the bond or insurance policy.

(3) The cancellation of a surety bond or insurance policy shall be effective thirty days after the department receives a cancellation notice.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-060, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-070 When will the department refund a security deposit? (1) The department will release a security deposit one year after the contractor's last registration has expired **unless** there is an unsatisfied final court judgment or claim against the contractor.

(2) The department will release a security deposit in less than one year after the contractor's last registration has expired if the contractor provides a surety bond covering **both the previous and current registration periods.**

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-070, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-080 How is a suit filed against a contractor? (1) A civil suit against a contractor must be filed in superior court. Unless the suit is filed in a superior court, the department will not be able to pay an unsatisfied final judgment against a secured contractor.

(2) Notice that a suit has been filed (a summons and complaint) against a contractor, the contractor's bond, or the contractor's deposit must be exclusively delivered to the department by registered or certified mail. **The department does not accept personal service of a summons and complaint.** The notice must be addressed to the department and must include three copies of the summons and complaint filed against the contractor, the contractor's bond or the contractor's deposit. The person filing the suit must pay a ten-dollar service fee to the department. See RCW 18.27.040(3).

(3) The summons and complaint against a contractor should include the following information:

(a) The name of the contractor exactly as it appears in the contractor's registration file;

(b) The contractor's business address;

(c) The names of the owners, partners or officers of the contractor; and

(d) The contractor's registration number.

(4) If the suit joins a bonding company, the summons and complaint should also include:

(a) The name of the bonding company that issued the contractor's bond;

(b) The bond number; and

(c) The effective date of the bond.

(5) Service is not complete until the department receives the ten-dollar fee and three copies of the summons and complaint.

(6) Within forty-eight hours of receiving a summons and complaint, the department must transmit a copy of the summons and complaint to the registrant at their last known address and to the registrant's surety.

(7) The department will return a summons and complaint without it being served, if the department cannot identify either the contractor or bonding company being sued.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-080, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-090 How are judgments against contractors paid? (1) The department can only pay a superior court final judgment. It cannot pay a district court judgment.

(2) A contractor's security held by the department can be used to pay a superior court final judgment against a secured contractor.

(3) The department must pay a superior court final judgment against a secured contractor if the claimant supplies the department with three certified copies of the unpaid final court judgment. The three certified copies must be delivered by registered or certified mail within one year of the date the final judgment was officially entered into the court record.

(4) For the department to pay a superior court final judgment, the claimant must include the following information with the copies of the judgment:

- (a) The name of the contractor exactly as it appears on the contractor's registration file;
- (b) The contractor's business address;
- (c) The names of the owners, partners, or officers of the contractor;
- (d) The contractor's registration number; and
- (e) The exact amount of the judgment, including court costs, attorneys' fees and interest.

If the department does not receive enough information to pay the judgment, it must inform the claimant.

(5) If a contractor is bonded, the department can neither pay a final court judgment against a contractor nor force the contractor or its bonding company to pay. Only the claimant can pursue payment from the contractor or its bonding company.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-090, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-110 Is a city, town, or county required to verify a contractor registration number? Before issuing a building permit, a city, county or town must verify the registration of the general or specialty contractor applying for the permit.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-110, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-111 How does a city, town, or county verify a contractor's registration? A city, town, or county may verify:

(1) An original contractor registration by receiving and duplicating a current contractor registration card, by checking the department's contractor registration data base or by

[Title 296 WAC—p. 2374]

calling the department to confirm that the contractor is registered.

(2) A nonoriginal contractor registration by either accepting a notarized copy of the original contractor registration card if that copy has been attested to by the person who applied for that original card or by accepting a facsimile verification from the department.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-111, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-112 Who is liable when a city, town, or county fails to verify a contractor's registration? The city, county, or town that issues a building permit without verifying the contractor's registration may be liable for a maximum penalty amount of five thousand dollars. See RCW 18.27.100 (7)(a).

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-112, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-300 What violations of chapter 18.27 RCW can result in the issuance of a notice of infraction?

(1) Under RCW 18.27.100, the department can issue a notice of infraction to a contractor for:

- (a) Using an unregistered name while acting as a contractor;
- (b) Using an unregistered name and address in advertising, correspondence, signs, documents, etc.;
- (c) Using a false or expired registration number in advertisements where a contractor's registration number is required;
- (d) Using the bond and insurance requirements of chapter 18.27 RCW to advertise as a bonded and insured contractor;
- (e) Using a false registration number to either solicit business or pose as a contractor;
- (f) Failing to include the contractor's current registration number in all advertising that shows the contractor's name or address. This registration number may be omitted in an alphabetized listing of registered contractors stating only the name, address, and telephone number. See RCW 18.27.100(3).

(2) Under RCW 18.27.114, the department can issue a notice of infraction to a contractor for failing to provide a residential or commercial customer with a proper disclosure statement before beginning a repair, alterations or construction project. See RCW 18.27.114(1) for both the project dollar cost limits affecting this requirement and a sample disclosure statement.

This requirement does not apply to either contracts authorized under chapter 39.04 RCW or to contractors contracting with other contractors.

(3) Under RCW 18.27.200, the department must issue a notice of infraction to a contractor for:

- (a) Advertising, offering to work, submitting a bid, or performing any contractor work without being registered or when it's registration is suspended or revoked; or
- (b) Transferring a valid contractor registration to an unregistered contractor; or
- (c) Allowing an unregistered contractor to work under a registration issued to another contractor.

Each day that a contractor works without being registered, works while the registration is suspended or revoked, or works under a registration issued to another contractor is a separate infraction. A cited contractor who continues to work while unregistered, or while their registration is suspended or revoked, or under a registration issued to another contractor is guilty of a separate misdemeanor for each day worked.

Each worksite at which a contractor works without being registered, works while the registration is suspended or revoked, or works under a registration issued to another contractor is a separate infraction. A cited contractor who continues to work while unregistered, or while their registration is suspended or revoked, or under a registration issued to another contractor is guilty of a separate misdemeanor for each worksite on which a violation occurs.

(4) See WAC 296-200A-400 for the specific monetary penalties associated with each of the violations discussed in this section.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-300, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-305 How does the department notify registered contractors regarding any unregistered subcontractors they may employ? (1) Unless a general contractor or its representative has been given written notification by the department that a subcontractor they have employed, who was registered when employed, has subsequently become unregistered, it is not illegal for the general contractor to employ that subcontractor. (See RCW 18.27.020(3).)

(2) To comply with RCW 18.27.020(3), the department, when appropriate, will issue a written "notice of unregistered subcontractors" to a general contractor or its representative.

(3) A notice of unregistered subcontractor issued under this section must be personally served on the general contractor named in the notice by the department's compliance inspectors or must be served by certified mail directed to the general contractor named in the notice.

(4) If the general contractor named in the notice is a firm or corporation, the notice may be personally served on any employee of the firm or corporation. If the notice is personally served upon an employee and the department is able to obtain the general contractor's address, the department must send a copy of the notice by certified mail to the general contractor within four days of service.

(5) A "notice of unregistered subcontractor" is **not** a notice of infraction.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-305, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-310 What information must be included in a notice of infraction? When a contractor violates RCW 18.27.100, 18.27.114 or 18.27.200, the department may issue a notice of infraction which must contain the following:

(1) Notification that an infraction has been committed and shall be final unless contested;

(2) Notification that an infraction is a noncriminal offense and is not punishable by imprisonment;

(3) The specific violation(s) leading to the issuance of the infraction;

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(4) The amount of penalty owed if the infraction is established;

(5) Notification of a right to a hearing (chapter 34.05 RCW) if requested within twenty days of receipt of the infraction;

(6) A reminder that the burden of proof in a hearing rests upon the state;

(7) Notification of a right to subpoena witnesses, including the inspector that issued the infraction;

(8) A reminder that a contractor is legally required to sign a notice of infraction and, by doing so, promises to respond to it;

(9) A reminder that a refusal to sign a notice of infraction is a misdemeanor and may be punishable by fine or imprisonment; and

(10) A reminder that a failure to respond to a notice of infraction is a misdemeanor and may be punishable by a fine or imprisonment.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-310, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-320 Who can be issued a notice of infraction? (1) A notice of infraction can be issued personally to the contractor named in the notice by the compliance inspector issuing it or the notice can be delivered to the contractor by certified mail.

(2) Any employee of a contractor can be issued a notice of infraction at a job site. When the notice is signed by the employee, it is binding upon the contractor. To avoid confusion, the department must have the employee sign the "name of the contractor, by name of the employee." The signature will appear as:

Jane Doe Construction Co.

(by) Richard Roe, Employee.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-320, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-330 If a notice of infraction is served on an employee, how is the contractor notified? (1) When the department issues a notice of infraction to a contractor's employee and it knows the contractor's name and address, the department has four days to deliver a copy of the notice to the contractor by certified mail. To ensure that the contractor receives this notice, the department must mail a second copy of the infraction by first class mail.

(2) If the department does not know the contractor's name and address, it does not need to mail a copy of the infraction to the contractor, however, the notice remains in force.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-330, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-340 How does a contractor appeal a notice of infraction? The contractor must:

(1) File two copies of an appeal notice, specifying the reasons for the appeal, at the office designated on the notice of infraction; **and**

(2) File the appeal notice within twenty days of the issuance of the infraction.

[Title 296 WAC—p. 2375]

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-340, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-350 Who presides over an appeal hearing and where is it held? An administrative law judge from the office of administrative hearings will preside over the hearing and give a decision. The hearing shall be conducted in the county where the infraction occurred. However, both the contractor and the department have a right to ask the administrative law judge to change the hearing's location.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-350, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-360 Who will represent the contractor and the department at the appeal hearing? Contractors may either represent themselves or be represented by an attorney. The department shall be represented by the office of attorney general.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-360, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-370 How is the appeal hearing conducted? The hearing process shall be conducted according to chapter 34.05 RCW, Administrative Procedure Act and chapter 10-08 WAC. All appeals of the hearing decision shall be to the superior court according to chapter 34.05 RCW.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-370, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-380 What evidence is admissible in an appeal hearing? All relevant evidence must be admitted in appeals hearings convened according to RCW 18.27.100, 18.27.114 and 18.27.200. The admission of evidence is further subject to chapter 34.05 RCW, Administrative Procedure Act.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-380, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-390 What does the department do with the appeal notices that they receive? The department must record and forward all appeal notices to the office of administrative hearings.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-390, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-400 What monetary penalties will be assessed for an infraction issued for violations of RCW 18.27.100, 18.27.114 or 18.27.200? (1) Monetary penalties that may be assessed for a violation of RCW 18.27.100 are:

RCW 18.27.100 Monetary Penalties	Dollar Amount
First Final Violation	\$ 100.00*
Second Final Violation	\$ 200.00
Third Final Violation	\$ 400.00
Fourth Final Violation	\$ 800.00
Fifth Final Violation	\$1,600.00
Sixth Final Violation	\$3,200.00
Each Additional Final Violation	\$5,000.00

* Minimum penalty per violation. Once a violation of RCW 18.27.100 becomes a final judgment, any additional violation is subject to an increased penalty as set forth in the above table.

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(2) Monetary penalties that may be assessed for a violation of RCW 18.27.114 are:

RCW 18.27.114 Monetary Penalties	Dollar Amount
First Final Violation	\$ 200.00*
Second Final Violation	\$ 400.00
Third Final Violation	\$ 800.00
Fourth Final Violation	\$1,600.00
Fifth Final Violation	\$3,200.00
Each Additional Final Violation	\$5,000.00

* Minimum penalty per violation. Once a violation of RCW 18.27.114 becomes a final judgment, any additional violation is subject to an increased penalty as set forth in the above table.

(3) Monetary penalties that may be assessed for a violation of RCW 18.27.200 according to RCW 18.27.340 (1) and (3) are:

(a)

RCW 18.27.340(1) Monetary Penalties	Dollar Amount
First Final Violation	\$ 200.00*
Second Final Violation	\$ 400.00
Third Final Violation	\$ 800.00
Fourth Final Violation	\$1,600.00
Fifth Final Violation	\$3,200.00
Each Additional Final Violation	\$5,000.00

* Minimum penalty per violation. Once a violation of RCW 18.27.340(1) becomes a final judgment, any additional violation is subject to an increased penalty as set forth in the above table.

(b)

RCW 18.27.340(3) Monetary Penalties	Dollar Amount
First Final Violation	\$1,000.00*
Second Final Violation	\$2,000.00
Third Final Violation	\$4,000.00
Each Additional Final Violation	\$5,000.00

* Minimum penalty per violation. Once a violation of RCW 18.27.340(3) becomes a final judgment, any additional violation is subject to an increased penalty as set forth in the above table. However, if the unregistered contractor becomes registered within ten days of receiving the notice of infraction and the notice is the contractor's first offense, the director may reduce the penalty. In no case can the director reduce the penalty below five hundred dollars.

(c) The director may waive a penalty collection from a contractor in exchange for a payment of restitution to a damaged consumer equal to the amount of the assessed penalty.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-400, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-405 When must a contractor pay assessed monetary penalties? (1) If a contractor named in a notice of infraction does not choose to appeal the notice, then the contractor must pay the department the amount of the penalty prescribed for the infraction. Payment must be by check or money order.

(2) After an administrative law judge decides that an infraction has been committed, a contractor who does not appeal the decision to a superior court, has thirty days to pay any outstanding monetary penalties. Failure to do so is a misdemeanor and shall be prosecuted in the county where the infraction occurred.

(3) A contractor who has exhausted all appeal opportunities and fails to pay an assessed monetary penalty within thirty days after exhausting those opportunities shall be guilty

of a misdemeanor and be prosecuted in the county where the infraction occurred.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-405, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-500 Is the department required to monitor unregistered contractors who become registered? Beginning January 1, 1998, the department must monitor, for two years, unregistered contractors who become registered after receiving an infraction or conviction. Information gathered as a result of this monitoring will be shared with the department of revenue and the department of employment security. This information will be shared every other month to determine whether any taxes, fees or penalties are owed to the state.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-500, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-510 Is the department required to report contractor compliance activities to the legislature?

(1) Beginning December 1, 1997, the department must provide an annual written report regarding contractor compliance to the following legislative committees:

- (a) The senate commerce and labor committee.
- (b) The house of representatives commerce and labor committee.
- (c) The senate ways and means committee.
- (d) The house of representatives appropriations committee.

(2) The report will cover a three year period and will include the following information:

- (a) The number of contractors found in violation of chapter 18.27 RCW and chapter 296-200A WAC;
- (b) The number of contractors who were assessed a monetary penalty and the amount of the penalty assessed;
- (c) The amount of assessed monetary penalties collected; and
- (d) The amount of assessed monetary penalties waived.

[Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-510, filed 12/2/97, effective 1/5/98.]

WAC 296-200A-900 What fees does the department charge contractors for issuance, renewal and reinstatement of certificates of registration? (1) For the purposes of this chapter:

- (a) A contractor **renews** its registration before it expires.
- (b) A contractor **reinstates** its registration after the registration:
 - (i) Has expired; or
 - (ii) Has been suspended because the contractor's insurance has expired; or
 - (iii) Has been suspended because the contractor's bond has been canceled or impaired.
- (c) A contractor **reregisters** when it changes its business structure.
- (2) The department charges the following fees:
 - (a) \$43.25 for each issuance, renewal or reregistration of a certificate of registration.
 - (b) \$50.00 for the reinstatement of a certificate of registration.

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(c) \$10.50 for providing a duplicate certificate of registration.

(d) \$20.75 for each requested certified letter prepared by the department.

(e) \$2.00 per copy for documents copied from a contractor's file. The maximum copy charge for copies from one contractor's file will be \$25.00.

[Statutory Authority: Chapters 18.106, 18.27 and 43.22 RCW. 98-12-041, § 296-200A-900, filed 5/29/98, effective 6/30/98. Statutory Authority: Chapter 18.27 RCW. 97-24-071, § 296-200A-900, filed 12/2/97, effective 1/5/98.]

Chapter 296-301 WAC

SAFETY STANDARDS FOR THE TEXTILE INDUSTRY

WAC

296-301-010	Textiles—Application requirements.
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296-301-130	Extractors.
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296-301-140	Sanforizing and palmer machine.
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296-301-150	Laundry washer tumbler or shaker.
296-301-155	Printing machine (roller type).
296-301-160	Calenders.
296-301-165	Rotary staple cutters.
296-301-170	Clothing folding machine.
296-301-175	Hand bailing machine.
296-301-180	Roll bench.
296-301-185	Cuttle or swing folder (overhead type).
296-301-190	Color-mixing room.
296-301-195	Open tanks and vats for mixing and storage of hot or corrosive liquids.
296-301-200	Dye kettles and vats.
296-301-205	Acid carboys.
296-301-210	Handling caustic soda and caustic potash.
296-301-215	First aid.
296-301-220	Personal protective equipment.
296-301-225	Workroom ventilation.

WAC 296-301-010 Textiles—Application requirements. (1) Application. The requirements of this chapter for textile safety apply to the design, installation, processes, operation, and maintenance of textile machinery, equipment, and other plant facilities in all plants engaged in the manufacture and processing of textiles, except those processes used exclusively in the manufacture of synthetic fibers.

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(2) These standards shall be augmented by the Washington state general safety and health standards, and any other regulations of general application which are or will be made applicable to all industries.

(3) The provisions of this chapter shall prevail in the event of conflict with or duplication of, provisions contained in chapter 296-24 WAC, the general safety and health standards and chapter 296-62 WAC, the general occupational health standards.

(4) WAC 296-24-006 through 296-24-012 of the general safety and health standards, shall apply where applicable to this industry.

[Order 74-19, § 296-301-010, filed 5/6/74.]

WAC 296-301-015 Definitions applicable to this chapter. (1) "Belt shifter" means a device for mechanically shifting a belt from one pulley to another.

(2) "Belt shifter lock" means a device for positively locking the belt shifter in position while the machine is stopped and the belt is idling on the loose pulleys.

(3) "Calendar" means a machine consisting of a set of heavy rollers mounted on vertical side frames and arranged to pass cloth between them. Calendars may have two to ten rollers, or bowls, some of which can be heated.

(4) "Embossing calender" means a calender with two or more rolls, one of which is engraved for producing figured effects of various kinds on a fabric.

(5) "Cans (drying)" means hollow cylindrical drums mounted in a frame so they can rotate. They are heated with steam and are used to dry fabrics or yarn as it passes around the perimeter of the can.

(6) "Carbonizing" means the removing of vegetable matter such as burns, straws, etc., from wool by treatment with acid, followed by heat. The undesired matter is reduced to a carbon-like form which may be removed by dusting or shaking.

(7) "Card" machine means a machine consisting of cylinders of various sizes—and in certain cases flats—covered with card clothing and set in relation to each other so that fibers in staple form may be separated into individual relationship. The speed of the cylinders and their direction of rotation varies. The finished product is delivered as a sliver. Cards of different types are: The revolving flat card, the roller-and-clearer card, etc.

(8) "Card clothing" means the material with which many of the surfaces of a card are covered; e.g., the cylinder, doffer, etc. It consists of a thick foundation material, usually made of textile fabrics, through which are pressed many fine, closely spaced, specially bent wires.

(9) "Comber" means a machine for combing fibers of cotton, wool, etc. The essential parts are a device for feeding forward a fringe of fibers at regular intervals and an arrangement of combs or pins which, at the right time, pass through the fringe. All tangled fibers, short fibers, and neps are removed and the long fibers are laid parallel.

(10) "Combing machinery" means a general classification, including combers, sliver lap machines, ribbon lap machines, and gill boxes, but excluding cards.

(11) "Cutter (rotary staple)" means a machine consisting of one or more rotary blades used for the purpose of cutting textile fibers into staple lengths.

(12) "Exposed to contact" means that the location of an object, material, nip point, or point of operation is such that a person is liable to come in contact with it in his normal course of employment.

(13) "Garnett machine" means any of a number of types of machines for opening hard twisted waste of wool, cotton, silk, etc. Essentially, such machines consist of a lickerin; one or more cylinders, each having a complement worker and stripper rolls; and a fancy roll and doffer. The action of such machines is somewhat like that of a wool card, but it is much more severe in that the various rolls are covered with garnett wire instead of card clothing.

(14) "Gill box" means a machine used in the worsted system of manufacturing yarns. Its function is to arrange the fibers in parallel order. Essentially, it consists of a pair of feed rolls and a series of followers where the followers move at a faster surface speed and perform a combing action.

(15) "Interlock" means a device that operates to prevent the operation of machine while the cover or door of the machine is open or unlocked, and which will also hold the cover or door closed and locked while the machine is in motion.

(16) "Jig (dye)" means a machine for dyeing piece goods. The cloth, at full width, passes from a roller through the dye liquor in an open vat and is then wound on another roller. The operation is repeated until the desired shade is obtained.

(17) "Kier" means a large metal vat, usually a pressure type, in which fabrics may be boiled out, bleached, etc.

(18) "Lapper (ribbon)" means a machine used to prepare laps for feeding a cotton comb; its purpose is to provide a uniform lap in which the fibers have been straightened as much as possible.

(19) "Lapper (sliver)" means a machine in which a number of parallel card slivers are drafted slightly, laid side by side in a compact sheet, and wound into a cylindrical package.

(20) "Loom" means a machine for effecting the interlacing of two series of yarns crossing one another at right angles. The warp yarns are wound on a warp beam and pass through heddles and reed. The filling is shot across in a shuttle and settled in place by reed and lay, and the fabric is wound on a cloth beam.

(21) "Starch mangle" means a mangle that is used specifically for starching cotton goods. It commonly consists of two large rolls and a shallow open vat with several immersion rolls. The vat contains the starch solution.

(22) "Water mangle" means a calender having two or more rolls used for squeezing water from fabrics before drying. Water mangles also may be used in other ways during the finishing of various fabrics.

(23) "Mule" means a type of spinning frame having a head stock and a carriage as its two main sections. The head stock is stationary. The carriage is movable and it carries the spindles which draft and spin the roving into the yarn. The carriage extends over the whole width of the machine and

moves slowly toward and away from the head stock during the spinning operation.

(24) "Nip" means the point of contact between two in-running rolls.

(25) "Openers and pickers" means a general classification which includes breaker pickers, intermediate pickers, finisher pickers, single process pickers, multiple process pickers, willow machines, card and picker waste cleaners, thread extractors, shredding machines, roving waste openers, shoddy pickers, bale breakers, feeders, vertical openers, lattice cleaners, horizontal cleaners, and any similar machinery equipped with either cylinders, screen section, calender section, rolls, or beaters used for the preparation of stock for further processing.

(26) "Paddler" means equipment consisting of a trough for a solution and two or more squeeze rolls between which cloth passes after being passed through a mordant or dye bath.

(27) "Point of operation" means that part of the machine where the work of cutting, shearing, squeezing, drawing, or manipulating the stock in any other way is done.

(28) "Roller printing machine" means a machine consisting of a large central cylinder, or pressure bowl, around the lower part of the perimeter of which is placed a series of engraved color rollers (each having a color trough), a furnisher roller, doctor blades, etc. The machine is used for printing fabrics.

(29) "Continuous bleaching ranges" means ranges of several types and may be made for cloth in rope or open-width form. The goods, after wetting out, pass through a squeeze roll into a saturator containing a solution of caustic soda and then to an enclosed J-box. A V-shaped arrangement is attached to the front part of the J-box for uniform and rapid saturation of the cloth with steam before it is packed down in the J-box. The cloth, in a single strand rope form, passes over a guide roll down the first arm of the "V" and up the second. Steam is injected into the "V" at the upper end of the second arm so that the cloth is rapidly saturated with steam at this point. The J-box capacity is such that cloth will remain hot for a sufficient time to complete the scouring action. It then passes a series of washers with a squeeze roll in between. The cloth then passes through a second set of saturator, J-box, and washer, where it is treated with the peroxide solution. By slight modification of the form of the unit, the same process can be applied to open-width cloth.

(30) "Mercerizing range" generally means a 3-bowl mangle, a tenter frame, and a number of boxes for washing and scouring. The whole setup is in a straight line and all parts operate continuously. The combination is used to saturate the cloth with sodium hydroxide, stretch it while saturated, and washing out most of the caustic before releasing tension.

(31) "Sanforizing machine" means a machine consisting of a large steam-heated cylinder, an endless, thick, woolen felt blanket which is in close contact with the cylinder for most of its perimeter, and an electrically heated shoe which presses the cloth against the blanket while the latter is in a stretched condition as it curves around feed-in roll.

(32) "Shearing machine" means a machine used in shearing cloth. Cutting action is provided by a number of steel

blades spirally mounted on a roller. The roller rotates in close contact with a fixed ledger blade. There may be from one to six such rollers on a machine.

(33) "Singeing machine" means a machine used particularly with cotton, comprised of a heated roller, plate, or an open gas flame. The material is rapidly passed over the roller or the plate or through the open gas flame to remove fuzz or hairiness on yarn or cloth by burning.

(34) "Slasher" means a machine used for applying a size mixture to warp yarns. Essentially, it consists of a stand for holding section beams, a size box, one or more cylindrical dryers or an enclosed hot air dryer, and a beaming end for finding the yarn on the loom beams.

(35) "Industrial organic solvent" means any organic volatile liquid or compound, or any combination of these substances which are used to dissolve or suspend a nonvolatile or slightly volatile substance for industrial utilization. It shall also apply to such substances when used as detergents or cleansing agents. It shall not apply to petroleum products when such products are used as fuel.

(36) "Tenter frame" means a machine for drying cloth under tension. It essentially consists of a pair of endless traveling chains fitted with clips of fine pins and carried on tracks. The cloth is firmly held at the selvages by the two chains which diverge as they move forward so that the cloth is brought to the desired width.

(37) "Warper" means any machine for preparing and arranging the yarns intended for the warp of a fabric, specifically, a beam warper.

[Order 74-19, § 296-301-015, filed 5/6/74.]

WAC 296-301-020 General safety requirements. (1) Means of stopping machines. Every textile machine shall be provided with individual mechanical or electrical means for stopping such machines. On machines driven by belts and shafting a locking-type shifter or an equivalent positive device shall be used. On operations where injury to the operator might result if motors were to restart after power failures, provision shall be made to prevent machines from automatically restarting upon restoration of power.

(2) Handles. Stopping and starting handles shall be designed to the proper length to prevent the worker's hand or fingers from striking against any revolving part, gear guard, or any other part of the machine.

(3) Machine guarding. An employer must ensure that power transmission parts are guarded according to the requirements of WAC 296-24-205 through 296-24-20527 of the general safety and health standards.

Exception: Only the side and face sections of a nip-point belt and pulley guard are required so that the guard extends at least:
 (a) Six inches beyond the rim of the pulley on the in-running and off-running sides of the belt; and
 (b) Two inches away from the rim and face of the pulley in all other directions.

(4) Housekeeping. Aisles and working spaces shall be kept in good order, clean and free of obstructions in accordance with requirements of WAC 296-24-120 through 296-24-12015, of the general safety and health standards.

(5) Inspection and maintenance. All guards and other safety devices, including starting and stopping devices, shall be properly maintained.

(6) Lighting and illumination. Lighting and illumination shall conform to the general occupational health standards, chapter 296-62 WAC.

(7) Identification of piping systems. Identification of piping systems shall conform to American National Standard A13.1-1956.

(8) Identification of physical hazards. Identification of physical hazards shall be in accordance with the requirements of WAC 296-24-135 through 296-24-13503, of the general safety and health standards.

(9) Steam pipes. All pipes carrying steam or hot water for process or servicing machinery, when exposed to contact and located within seven feet of the floor or working platform shall be covered with a heat-insulating material, or guarded with equivalent protection.

[Statutory Authority: RCW 49.17.010, [49.17.]040 and [49.17.]050. 98-10-073 and 98-24-120, § 296-301-020, filed 5/4/98 and 12/2/98, effective 10/1/99; Order 74-19, § 296-301-020, filed 5/6/74.]

WAC 296-301-025 Openers and pickers. (1) Beater guards. When any opening or picker machinery is equipped with a beater, such beater shall be provided with metal covers which will prevent contact with the beater. Such covers shall be provided with an interlock which will prevent the cover from being raised while the machine is in motion and prevent the operation of the machine while the cover is open.

(2) Cleanout holes. Cleanout holes within reaching distance of the fan or picker beater shall have their covers securely fastened and they shall not be opened while the machine is in motion.

(3) Feed rolls. The feed rolls on all opening and picking machinery shall be covered with a guard designed to prevent the operator from reaching the nip while the machinery is in operation.

(4) Removal of foreign ferrous material. All textile opener lines shall be equipped with magnetic separators, tramp iron separators, or other means for the removal of foreign ferrous material.

[Order 74-19, § 296-301-025, filed 5/6/74.]

WAC 296-301-030 Cotton cards. (1) Enclosures. Cylinder and lickerins shall be equipped with guards and the doffers should be enclosed.

(2) Enclosure fastenings. The enclosures or covers shall be kept in place while the machine is in operation, except when stripping or grinding.

(3) Stripping rolls. On operations calling for flat strippings which are allowed to fall on the doffer cover, where such strippings are removed by hand, the doffer cover shall be kept closed and securely fastened to prevent the opening of the cover while the machine is in operation. When it becomes necessary to clean the cards while they are in motion, a long-handled brush or dust mop shall be used.

[Order 74-19, § 296-301-030, filed 5/6/74.]

WAC 296-301-035 Garnett machines. (1) Lickerin. Garnett lickerins shall be enclosed.

(2) Fancy rolls. Garnett fancy rolls shall be enclosed by covers. These shall be installed in a way that keeps worker rolls reasonably accessible for removal or adjustment.

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(3) Underside of machine. The underside of the garnett shall be guarded by a screen mesh or other form of enclosure to prevent access while machine is running.

[Order 74-19, § 296-301-035, filed 5/6/74.]

WAC 296-301-040 Spinning mules. A substantial fender of metal or hardwood shall be installed in front of the carriage wheels, the fender to extend to within one-fourth inch of the rail.

[Order 74-19, § 296-301-040, filed 5/6/74.]

WAC 296-301-045 Slashers—Scope and application. All sections of this chapter which include WAC 296-301-045 in the section number apply to slashers.

[Order 74-19, § 296-301-045, filed 5/6/74.]

WAC 296-301-04501 Cylinder dryers. (1) Reducing valves, safety valves, and pressure gages. Reducing valves, safety valves, and pressure gages shall conform to the ASME Pressure Vessel Code, section VIII, Unfired Pressure Vessels, 1968.

(2) Vacuum relief valves. Vacuum relief valves shall conform to the ASME Code for Pressure Vessels, section VIII, Unfired Pressure Vessels, 1968.

(3) Lever control. When slashers are operated by control levers, these levers shall be connected to a horizontal bar or treadle located not more than 69 inches above the floor to control the operation from any point.

(4) Pushbutton control. Slashers operated by pushbutton control shall have stop and start buttons located at each end of the machine, and additional buttons located on both sides of the machine, at the size box and the delivery end. If calender rolls are used, additional buttons shall be provided at both sides of the machine at points near the nips, except when slashers are equipped with an enclosed dryer.

(5) Nip guards. All nip guards shall comply with the requirements of WAC 296-301-04503(4).

(6) Cylinder enclosure. When enclosures or hoods are used over cylinder drying rolls, such enclosures or hoods shall be provided with an exhaust system which will effectively prevent wet air and steam from escaping into the workroom.

(7) Expansion chambers. Slasher kettles and cookers shall be provided with expansion chambers in the covers, or drains, to prevent surging over. Steam-control valves shall be so located that they can be operated without exposing the worker to moving parts, hot surfaces, or steam.

[Order 74-19, § 296-301-04501, filed 5/6/74.]

WAC 296-301-04503 Enclosed hot air dryers. (1) Lever control. When slashers are operated by control levers, these levers shall be connected to a horizontal bar or treadle located not more than 69 inches above the floor to control the operation from any point.

(2) Push-button control. Slashers operated by push-button control shall have one start button at each end of the machine and stop buttons shall be located on both sides of the machines at intervals spaced not more than 6 feet on centers.

Note: Inching buttons should be installed.

(3) Dryer enclosure. The dryer enclosure shall be provided with an exhaust system which will effectively prevent wet air and steam from escaping into the workroom.

(4) Nip guards. All nip guards shall comply with Table R-1.

TABLE R-1
GUARD OPENINGS

Openings in the guard or between the guard and working surface shall not be greater than the following:

Distance of opening from nip point	Maximum width of opening
0 to 1 1/2	1/4
1 1/2 to 2 1/2	3/8
2 1/2 to 3 1/2	1/2
3 1/2 to 5 1/2	5/8
5 1/2 to 6 1/2	3/4
6 1/2 to 7 1/2	7/8
7 1/2 to 8 1/2	1 1/4

The measurements in Table R-1 are all in inches.

(5) Expansion chambers. Slasher kettles and cookers shall be provided with expansion chambers in the covers, or drains, to prevent surging over. Steam control valves shall be so located that they can be operated without exposing the worker to moving parts, hot surfaces, or steam.

[Order 74-19, § 296-301-04503, filed 5/6/74.]

WAC 296-301-050 Warpings. (1) Swiveled double-bar gates. Swiveled double-bar gates shall be installed on all warpings operating in excess of 450 yards per minute. These gates shall be so interlocked that the machine cannot be operated until the gate is in the "closed position," except for the purpose of inching or jogging.

(2) Closed position. "Closed position" shall mean that the top bar of the gate shall be at least 42 inches from the floor or working platform; and the lower bar shall be at least 21 inches from the floor or working platform; and the gate shall be located 15 inches from the vertical tangent to the beam head.

[Order 74-19, § 296-301-050, filed 5/6/74.]

WAC 296-301-055 Drawing frames, slubbers, roving parts, cotton combers, ring spinning frames, twistors. Gear housing covers on all installations of drawing frames, slubbers, roving frames, cotton combers, ring spinning frames, and twistors shall be equipped with interlocks.

[Order 74-19, § 296-301-055, filed 5/6/74.]

WAC 296-301-060 Gill boxes. (1) Pin guard. A guard shall be placed ahead of the feed end and shall be so designed that it will prevent the worker's fingers from being caught in the pins of the intersecting fallers.

(2) Nip guards. All nip guards shall comply with the requirements of WAC 296-301-04503(4).

[Order 74-19, § 296-301-060, filed 5/6/74.]

WAC 296-301-065 Heavy draw boxes, finishers, and speeders used in worsted drawing. (1) Band pulley covers. Covers for band pulleys shall be closed when the machine is in motion.

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(2) Benches or working platforms. Benches or working platforms approximately 10 inches in height and 8 inches in width should be installed along the entire running length of the machine for the worker to stand on while creeling the machine. Such benches or platforms shall be covered with an abrasive or nonslip material.

[Order 74-19, § 296-301-065, filed 5/6/74.]

WAC 296-301-070 Silver and ribbon lappers (cotton). Cover guard. An interlocking cover guard shall be installed over the large calender drums and the lap spool, designed to prevent the operator from coming in contact with the nip.

[Order 74-19, § 296-301-070, filed 5/6/74.]

WAC 296-301-075 Looms. (1) Shuttle guard. Each loom shall be equipped with a guard designed to minimize the danger of the shuttle flying out of the shed.

(2) Protection for loom fixer. Provisions shall be made so that every loom fixer can prevent the loom from being started while he is at work on the loom. This may be accomplished by means of a lock, the key to which is retained in the possession of the loom fixer, or by some other effective means to prevent starting the loom.

[Order 74-19, § 296-301-075, filed 5/6/74.]

WAC 296-301-080 Shearing machines. All revolving blades on shearing machines shall be guarded so that the opening between the cloth surface and the bottom of the guard will not exceed three-eighths inch.

[Order 74-19, § 296-301-080, filed 5/6/74.]

WAC 296-301-085 Continuous bleach range (cotton and rayon). (1) J-box protection. Each valve controlling the flow of steam, injurious gases, or liquids into a J-box shall be equipped with a chain, lock, and key, so that any worker who enters the J-box can lock the valve and retain the key in his possession. Any other method which will prevent steam, injurious gases, or liquids from entering the J-box while the worker is in it will comply with this provision.

(2) Open-width bleaching. The nip of all in-running rolls on open-width bleaching machine rolls shall be protected with a guard to prevent the worker from being caught at the nip. The guard shall extend across the entire length of the nip.

[Order 74-19, § 296-301-085, filed 5/6/74.]

WAC 296-301-090 Kiers. (1) Reducing valves, safety valves, and pressure gages. Reducing valves, safety valves, and pressure gages shall conform to the ASME Code for Unfired Pressure Vessels, section VIII, Unfired Pressure Vessels, 1968.

(2) Kier valve protection. Each valve controlling the flow of steam, injurious gases, or liquids into a kier shall be equipped with a chain, lock, and key, so that any worker who enters the kier can lock the valve and retains the key. Any other method which will prevent steam, injurious gases, or liquids from entering the kier while the worker is in it will be acceptable.

[Order 74-19, § 296-301-090, filed 5/6/74.]

WAC 296-301-095 Gray and white bins. Guard rails conforming to WAC 296-24-750 through 296-24-75011, of the general safety and health standards, shall be provided where workers are required to plait by hand from the top of the bin so as to protect the worker from falling to a lower level.

[Order 74-19, § 296-301-095, filed 5/6/74.]

WAC 296-301-100 Mercerizing range (piece goods).

(1) Stopping devices. A stopping device shall be provided at each end of the machine.

(2) Frame ends. A guard shall be installed at each end of the frame between the in-running chain and the clip opener, to prevent the worker's fingers from being caught.

(3) Mangle and washers. The nip at the in-running rolls shall conform to WAC 296-301-04503(4).

[Order 74-19, § 296-301-100, filed 5/6/74.]

WAC 296-301-105 Tenter frames. (1) Stopping devices. A stopping device shall be provided at each end of the machine.

(2) Frame ends. A guard shall be installed at each end of the frame at the in-running chain and clip opener.

(3) Oil cups. Oil cups shall be located to permit safe and easy access. They shall be of the extension type to permit oiling while machines are operating.

[Order 74-19, § 296-301-105, filed 5/6/74.]

WAC 296-301-110 Dyeing jigs. (1) Stopping devices. Each dye jig shall be equipped with individual mechanical or electrical means for stopping the machine.

(2) Roll arms. Roll arms on jigs shall be built to allow for extra large batches, and to prevent the center bar from being forced off, causing the batch to fall.

[Order 74-19, § 296-301-110, filed 5/6/74.]

WAC 296-301-115 Padders—Nip guards. All nip guards shall comply with the requirements of WAC 296-301-04503(4).

[Order 74-19, § 296-301-115, filed 5/6/74.]

WAC 296-301-120 Drying cans. (1) Pressure reducing valves and pressure gages. Pressure reducing valves and pressure gages shall conform to the ASME Code for Pressure Vessels, section VIII, 1968, Unfired Pressure Vessels.

(2) Vacuum collapse. If cans are not designed to prevent vacuum collapse, each can shall be equipped with one or more vacuum relief valves with openings of such a size as to prevent the collapse of the can if vacuum occurs.

[Order 74-19, § 296-301-120, filed 5/6/74.]

WAC 296-301-125 Ironer. (1) Each flat-work or collar ironer shall be equipped with a safety bar or other guard across the entire front of the feed or first pressure rolls, so arranged that the striking of the bar or guard by the hand of the operator or other person will stop the machine. The pressure rolls shall be covered or guarded so that the operator or other person cannot reach into the rolls without removing the guard. This may be either a vertical guard on all sides or a complete cover. If a vertical guard is used, the distance from

the floor or working platform to the top of guard shall be not less than 6 feet.

[Order 74-19, § 296-301-125, filed 5/6/74.]

WAC 296-301-130 Extractors. (1) Centrifugal extractor.

(a) Cover. Each extractor shall be equipped with a metal cover.

(b) Interlocking device. Each extractor shall be equipped with an interlocking device that will prevent the cover from being opened while the basket is in motion, and also prevent the power operation of the basket while the cover is open.

(c) Brakes. Each extractor shall be equipped with a mechanically or electrically operated brake to quickly stop the basket when the power driving the basket is shut off.

(d) Maximum allowable speed. Each centrifugal extractor shall be effectively secured in position on the floor or foundation so as to eliminate unnecessary vibration, and shall not be operated at a speed greater than the manufacturer's rating, which shall be stamped where easily visible in letters not less than one-quarter inch in height. The maximum allowable speed shall be given in revolutions per minute (rpm).

(2) Engine drum extractor—Over-speed governor. Each engine individually driving an extractor shall be provided with an engine stop approved as specified in WAC 296-24-006, of the general safety and health standards, and a speed limit governor.

(3) Squeezer or wringer extractor—Nip guards. All nip guards shall comply with the requirements of WAC 296-301-04503(4).

[Order 74-19, § 296-301-130, filed 5/6/74.]

WAC 296-301-135 Nip guards. All nip guards for water mangle, starch mangle, backwasher (worsted yarn) crabbing machines, decating machines, shall comply with the requirements of WAC 296-301-04503(4).

[Order 74-19, § 296-301-135, filed 5/6/74.]

WAC 296-301-140 Sanforizing and palmer machine. A safety trip rod, cable, or wire center cord shall be provided across the front and back of all palmer cylinders extending the length of the face of the cylinder. It shall operate readily whether pushed or pulled. This safety trip shall be not more than 72 inches above the level on which the operator stands and shall be readily accessible.

[Order 74-19, § 296-301-140, filed 5/6/74.]

WAC 296-301-145 Rope washers. (1) Splash guard. Splash guards shall be installed on all rope washers unless the machine is so designed as to prevent the water or liquid from splashing the operator, the floor, or working surface.

(2) Safety stop bar. A safety trip rod, cable or wire center cord shall be provided across the front and back of all rope washers extending the length of the face of the washer. It shall operate readily whether pushed or pulled. This safety trip shall be not more than 72 inches above the level on which the operator stands and shall be readily accessible.

[Order 74-19, § 296-301-145, filed 5/6/74.]

WAC 296-301-150 Laundry washer tumbler or shaker. (1) Interlocking device. Each drying tumbler, each double cylinder shaker or clothes tumbler, and each washing machine shall be equipped with an interlock device which will prevent the power operation of the inside cylinder when the outer door on the case or shell is open, and which will also prevent the outer door on the case or shell from being opened without shutting off the power. This should not prevent the movement of the inner cylinder by means of a hand operated mechanism or an "inching device."

(2) Means of holding covers or doors in open position. Each enclosed barrel shall also be equipped with adequate means for holding open the doors or covers of the inner and outer cylinders or shells while it is being loaded or unloaded.
[Order 74-19, § 296-301-150, filed 5/6/74.]

WAC 296-301-155 Printing machine (roller type). (1) Nip guards. All nip guards shall comply with the requirements of WAC 296-301-04503(4).

(2) Crown wheel and roller gear nip protection. The engraved roller gears and the large crown wheel shall be provided with a protective disc which will enclose the nips of the in-running gears. Individual discs for each nip will be deemed to be in compliance with the provisions of WAC 296-301-04503(4).

[Order 74-19, § 296-301-155, filed 5/6/74.]

WAC 296-301-160 Calenders. The nip at the in-running side of the rolls shall be provided with a guard extending across the entire length of the nip and arranged to prevent the fingers of the workers from being pulled in between the rolls or between the guard and the rolls, and constructed so that the cloth can be fed into the rolls safely.

[Order 74-19, § 296-301-160, filed 5/6/74.]

WAC 296-301-165 Rotary staple cutters. A guard shall be installed completely enclosing the cutters to prevent the hands of the operator from reaching the cutting zone.

[Order 74-19, § 296-301-165, filed 5/6/74.]

WAC 296-301-170 Clothing folding machine. The crank arm and blade guide rods on both sides of the cloth-folding machines shall be protected from contact by barrier guards constructed to conform to the requirements of WAC 296-24-195 through 296-24-19513, of the general safety and health standards.

[Order 74-19, § 296-301-170, filed 5/6/74.]

WAC 296-301-175 Hand bailing machine. An angle-iron-handle stop guard shall be installed at the right angle to the frame of the machine. The stop guard shall be so designed and so located that it will prevent the handle from traveling beyond the vertical position should the handle slip from the operator's hand when the pawl has been released from the teeth of the takeup gear.

[Order 74-19, § 296-301-175, filed 5/6/74.]

WAC 296-301-180 Roll bench. Cleats shall be installed on the ends of roll benches.

[Order 74-19, § 296-301-180, filed 5/6/74.]

(1999 Ed.)

WAC 296-301-185 Cuttle or swing folder (overhead type). The bottom of the overhead folders shall be located not less than 7 feet from the floor or working surface.

[Order 74-19, § 296-301-185, filed 5/6/74.]

WAC 296-301-190 Color-mixing room. Floors in color-mixing rooms shall be constructed to drain easily.

[Order 74-19, § 296-301-190, filed 5/6/74.]

WAC 296-301-195 Open tanks and vats for mixing and storage of hot or corrosive liquids. (1) Protection against falls. Open tanks and vats containing hot or corrosive liquids shall be provided with guardrails to conform to the requirements of WAC 296-24-750 through 296-24-75011, of the general safety and health standards.

(2) Shutoff valves. Boiling tanks, caustic tanks, and hot liquid containers, so located that the operator cannot see the contents from the floor or working area, shall have emergency shutoff valves controlled from a point not subject to danger of splash. Valves shall conform to the ASME Pressure Vessel Code, section VIII, Unfired Pressure Vessels, 1968.

[Order 74-19, § 296-301-195, filed 5/6/74.]

WAC 296-301-200 Dye kettles and vats. Pipes or drains of sufficient capacity to carry the contents safely away from the working area shall be installed where there are dye kettles and vats which may at any time contain hot or corrosive liquids. These shall not empty directly onto the floor.

[Order 74-19, § 296-301-200, filed 5/6/74.]

WAC 296-301-205 Acid carboys. Carboys shall be provided with inclinators, or the acid shall be withdrawn from the carboys by means of pumping without pressure in the carboy, or by means of hand operated siphons.

[Order 74-19, § 296-301-205, filed 5/6/74.]

WAC 296-301-210 Handling caustic soda and caustic potash. Means shall be provided for handling and emptying caustic soda and caustic potash containers to prevent workers from coming in contact with the caustic (see WAC 296-301-220).

[Order 74-19, § 296-301-210, filed 5/6/74.]

WAC 296-301-215 First aid. The provisions of WAC 296-24-015 through 296-24-070, of the general safety and health standards, shall apply to the textile industry.

[Order 74-19, § 296-301-215, filed 5/6/74.]

WAC 296-301-220 Personal protective equipment.

(1) Personal protective equipment. Workers engaged in handling acids or caustics in bulk, repairing pipe lines containing acids or caustics, etc., shall be provided with protective occupational (safety) equipment to conform to the requirements of WAC 296-24-07501, 296-24-07801, and 296-24-081 through 296-24-08113, of the general safety and health standards.

(2) Respirators, gas masks, and such appliances, for emergency use only, shall be of a type required by WAC 296-24-081 through 296-24-08113, of the general safety and health standards.

[Order 74-19, § 296-301-220, filed 5/6/74.]

WAC 296-301-225 Workroom ventilation. In all workrooms in which potentially toxic substances are used, the maximum allowable concentrations listed in WAC 296-62-075 through 296-62-07515, of the general occupational health standards, shall be maintained. Open surface tanks shall conform to the requirements of WAC 296-62-11021.

[Order 74-19, § 296-301-225, filed 5/6/74.]

Chapter 296-302 WAC

SAFETY STANDARDS FOR BAKERY EQUIPMENT

WAC

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WAC 296-302-010 Bakery equipment—General requirements. (1) Application. The requirements of this chapter shall apply to the design, installation, operation and maintenance of machinery and equipment used within a bakery.

(2) These standards shall be augmented by the Washington state general safety and health standards, and any other regulations of general application which are or will be made applicable to all industries.

(3) The provisions of this chapter shall prevail in the event of a conflict with, or duplication of, provisions contained in chapters 296-24 and 296-62 WAC.

(4) WAC 296-24-006 through 296-24-012 of the general safety and health standards, chapter 296-24 WAC, shall apply where applicable to this industry.

[Order 74-17, § 296-302-010, filed 5/6/74.]

[Title 296 WAC—p. 2384]

WAC 296-302-015 Definitions. (1) "Dumpbin and blender" applies to those elements of a flour handling system in which flour in bags is first emptied for distribution.

(2) "Flour elevator" means the conveyor which is used to convey flour in a vertical direction and it includes bucket, spiral screw, or bulkflow conveyors.

(3) "Screw conveyor" means the conveyor which is used to convey flour in a horizontal or inclined plane by means of a continuous spiral screw enclosed in a suitable casing which follows the same general contour of the perimeter of the screw.

(4) "Bolting reel" means a device in which the flour is screened through a rotating drum.

(5) "Sifter" means a device in which flour is sifted. It may be of the brush, oscillating, or vibrating type.

(6) "Flour scale" means a scale for weighing flour.

(7) "Flour gate" means the device or devices used to control the delivery of flour.

(8) "Direct fired ovens" are ovens which burn fuel directly inside the baking chamber.

(9) "Direct recirculating ovens" are ovens which have heating systems consisting of one or more heaters (located inside or outside the baking chamber), each heater being equipped with a burner, the products of combustion of which are mixed with spent gases returned from the oven. Combustion gases are circulated through the heater and oven chamber by a fan. An overflow or vent removes part of the spent combustion gases to compensate for fresh combustion gases added by the burner.

(10) "Flue-type ovens" are ovens which burn fuel in a furnace which is connected through flues which carry the combustion gases to stack.

(11) "Indirect multiple-burner ovens" are ovens which are heated by burners (usually gas) which are totally enclosed in such a way that unburned gases or products of combustion cannot enter the baking chamber.

(12) "Steam-tube ovens" are ovens which are heated by a group of tubes which are partially filled with liquid and sealed at both ends. A small part of each tube is exposed to the heat of a furnace and the larger part placed inside the baking chamber. Heat is transmitted by evaporating liquid in the furnace end of the tube. Steam thus formed travels to the other end of the tube, where the steam condenses and returns to the furnace by gravity.

(13) "Indirect recirculating ovens" are ovens which are equipped with a gas tight duct system, a furnace, and a circulating fan. Gases of combustion are circulated through this enclosed system and mixed with fresh combustion gases generated by the burner in the combustion chamber. A vent or overflow removes a portion of the gases to compensate for the fresh gases added by the burner. No unburned gases or products of combustion have access to the baking chamber.

(14) "Electric ovens" are ovens which are heated entirely by passing an electric current through resistance elements.

(15) "NFPA" means National Fire Protection Association.

[Order 74-17, § 296-302-015, filed 5/6/74.]

WAC 296-302-020 General machine guarding. (1) Electrical grounding. The frame of each machine which is

driven by an electric motor or has any electrical connection shall be effectively grounded.

(2) Gears. Refer to WAC 296-24-150, machinery and machine guarding of the general safety and health standards, chapter 296-24 WAC.

(3) Removable covers or guards. Any covers or guards which must be removed for cleaning and adjustment shall be made easily removable in order that they may be removed and replaced with the least effort.

(4) Ventilation through machine guards. Where it is necessary to guard motors or other equipment which require ventilation, guards should be so designed that they will not restrict the circulation of the air.

[Order 74-17, § 296-302-020, filed 5/6/74.]

WAC 296-302-025 Flour-handling equipment—

Scope and application. All sections of this chapter which include WAC 296-302-025 in the section number, apply to flour-handling equipment.

[Order 74-17, § 296-302-025, filed 5/6/74.]

WAC 296-302-02501 General requirements for flour-

handling. (1) Wherever any of the various pieces of apparatus comprising a flour-handling system are run in electrical unit with one another the following safeguards shall apply:

(a) Each apparatus shall be safeguarded by a disconnecting means for the motor circuits as required by National Electrical Code - 1971 edition.

(b) Wherever a flour-handling system is of such size that the beginning of its operation is far remote from its final delivery end, all electric motors operating each apparatus comprising this system shall be controlled at each of two points, one located at each remote end, either of which will stop all motors.

(c) Motor control switches shall be capable of being locked in the open position.

(d) Control circuits for magnetic controllers shall be so arranged that the opening of any one of several limit switches, which may be on an individual unit, will serve to de-energize all of the motors of that unit.

(2) Removable covers on all flour-handling equipment shall be so designed that the lifting effort shall not be more than 50 pounds.

(3) Wherever flour-handling systems are of large construction, suitable walkways or platforms or both shall be constructed around and over bins and apparatus, in accordance with the applicable requirements of the general safety and health standards, chapter 296-24 WAC.

(a) All walkway surfaces shall be maintained in nonslip condition.

(b) Elevated walkways shall have railings and toeboards in compliance with applicable requirements of the general safety and health standards, chapter 296-24 WAC.

(c) All ladders leading to upper walkways shall be in accordance with the applicable requirements of the general safety and health standards, chapter 296-24 WAC.

(d) Wherever walkways are near the ceiling construction of the building, where obstruction to head room is lower than normal standing height, methods shall be provided to warn any occupant of the walkway. This should be done by means

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of "tell tales" or other suitable means located ahead of the obstruction. Suitable signs shall also be placed on walkways warning occupants of possible danger.

(4) All oscillating and vibrating sifters shall be protected with guard rails in compliance with applicable requirements of the general safety and health standards, chapter 296-24 WAC.

(5) All mechanical transmission shafting, gearing, and sprocket drives shall be completely guarded, preferably with dust-tight housing. Lubrication fittings shall extend to the outside of the guard.

(6) All guards shall be readily removable.

(7) All flour-handling equipment, each individual unit or the entire system collectively, shall be so constructed that all interior or exterior protruding corners are of a rounded nature.

(8) When Class II hazardous conditions prevail, electric motors, motor controllers, and switches shall be of the type approved for such locations in accordance with the requirements of the National Electrical Code - 1971 edition.

[Order 74-17, § 296-302-02501, filed 5/6/74.]

WAC 296-302-02503 Bag chutes and bag lifts (bag-

arm elevators). (1) Bag chutes (gravity chutes for handling flour bags) shall be so designed so as to keep to a minimum the speed of flour bags. If the chute inclines more than 30° from the horizontal, there shall be an upturn at the lower end of the chute to slow down the bags.

(2) Bag-arm elevators with manual takeoff shall be designed to operate at a capacity not exceeding seven bags per minute. The arms on the conveyor chain shall be so spaced as to obtain the full capacity of the elevator with the lowest possible chain speed. There shall be an electric limit switch at the unloading end of the bag-arm elevator so installed as to automatically stop the conveyor chain if any bag fails to clear the conveyor arms.

(3) The conveyor chain on bag-arm elevators shall travel in a suitable structure and all drums shall be completely guarded, so that in case of a broken chain link the remainder of the chain will remain within its guides.

(4) Manlifts shall not be used in bakeries. Bag or barrel lifts shall not be used as manlifts.

[Order 74-17, § 296-302-02503, filed 5/6/74.]

WAC 296-302-02505 Dumpbin and blender. (1) The dumpbin or blender shall be constructed of metal or other nonsplintering material.

(2) Openings shall be protected by means of bars or grids. If grids are made of mesh, the openings shall be not more than 3 inches in either length or width. If parallel bars or rods are used, they shall be spaced not more than 3 inches apart on centers.

(3) Hinged dumpbin covers shall be provided with locks or latches to hold the covers in the open position, so that they will not accidentally fall down while the dumpbin is in operation.

(4) Dumpbins and blenders shall be so constructed that no separate pits in floors shall be required at the point which connects the final discharge to the usual elevator.

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(5) All dumpbin and blender hoods shall be of sufficient capacity to prevent circulation of flour dust outside the hoods.

(6) All dumpbins shall be of such a height from the floor as to enable the operator to dump flour from bags, without causing undue strain or fatigue. Where the edge of any bin is more than 24 inches above the floor, a bag rest step shall be provided.

(7) A control device for stopping the dumpbin and blender shall be provided close to the operator's work station.

(8) A screen shall be provided in the suction nozzle over the bin or blender to prevent sacks that are being cleaned from getting into the rotor of the dust collecting fan.

[Order 74-17, § 296-302-02505, filed 5/6/74.]

WAC 296-302-02507 Flour elevators. (1) Flour elevators shall be constructed of metal or other nonsplintering material.

(2) All removable sections of the elevator casing shall be equipped with stationary clamps for quick removal, or shall be equipped with equivalent locking devices which contain no loose parts which may become detached from either the casing or the cover.

[Order 74-17, § 296-302-02507, filed 5/6/74.]

WAC 296-302-02509 Bolting reels. (1) Bolting reels shall be constructed of metal or other nonsplintering material, with the exception of the bolting cloth.

(2) Refuse tailing spouts shall be readily accessible and shall be located at a safe distance from moving parts.

[Order 74-17, § 296-302-02509, filed 5/6/74.]

WAC 296-302-02511 Storage bins. (1) Storage bins shall be constructed of metal or other nonsplintering material.

(2) Storage bins shall be provided with gaskets and locks or latches to keep the cover closed, or other equivalent devices in order to ensure the dust tightness of the cover. Covers at openings where an employee may enter the bin shall also be provided with a hasp and a lock, so located that the employee shall lock the cover in the open position whenever it is necessary to enter the bin.

(3) Storage bins where the side is more than 5 feet in depth shall be provided with standard stationary safety ladders, both inside and outside, to reach from floor level to top of bin and from top of bin to inside bottom, keeping the ladder end away from the moving screw conveyor.

(4) Loading distribution conveyors shall be located in top of bin centrally unhooded, and all covers for entrance to the bins shall be located away from the loading distribution conveyor.

(5) An electric limit switch or other suitable protective device shall be provided in the top of the bin centrally over the loading screw conveyor on the opposite end of the flour entrance opening. It shall be so designed as to stop the loading screw if an excessive amount of flour is delivered to the bin.

(6) The main entrance cover of large storage bins located at the interior exit ladder shall be provided with an electric interlock for motors operating both feed and unloading

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screw, so that these motors cannot operate while the cover is open.

[Order 74-17, § 296-302-02511, filed 5/6/74.]

WAC 296-302-02513 Screw conveyors. (1) Screw conveyors shall be constructed of metal or other nonsplintering material.

(2) Each dead-end screw conveyor shall be provided with an overflow safety gate which will operate an electric limit switch to shut down the conveyor before dangerous pressure of material is built up at the dead end.

(3) The covers of all screw conveyors shall be made removable in convenient sections, held on with stationary clamps located at suitable intervals keeping all covers dust-tight. Where drop or hinged bottom sections are provided this provision shall not apply.

[Order 74-17, § 296-302-02513, filed 5/6/74.]

WAC 296-302-02515 Sifters. (1) Enclosures of all types of flour sifters shall be so constructed that they are dust-tight but readily accessible for interior inspection.

(2) Oscillating and vibrating sifters shall be so constructed that all moving parts are well within the outer frame of the apparatus.

(3) Refuse tailing spouts of all types of sifters shall be readily accessible and shall be located at a safe distance from moving parts.

[Order 74-17, § 296-302-02515, filed 5/6/74.]

WAC 296-302-02517 Flour scales. (1) Flour scales shall be constructed of metal or other nonsplintering material.

(2) Where a transparent covering is provided over dial scales it shall be made of a nonshatterable transparent material.

(3) Traveling or track-type flour scales shall be equipped with bar handles for moving same. The bar should be at least 1 inch in diameter. Trolley track wheels shall be guarded.

(4) All moving trolley wheels located within 8 feet 6 inches of floors or platforms shall be fully guarded on sides and ahead of rotating motion.

(5) The scale cutoff switch shall be totally enclosed and connected to the scale beam in such a manner as to protect the operator from contact.

(6) Where two or more scales are used on traveling flour scales, interlocks shall be provided so that the gate will not open unless the hopper is below.

[Order 74-15, § 296-302-02517, filed 5/6/74.]

WAC 296-302-02519 Automatic flour gates. Automatic flourgate equipment shall be constructed of metal or other nonsplintering material.

[Order 74-17, § 296-302-02519, filed 5/6/74.]

WAC 296-302-03001 Horizontal dough mixers. (1) Mixers with external power application shall have all belts, chains, gears, pulleys, sprockets, clutches, and other moving parts completely enclosed.

(2) Mixers with built-in power units shall have all drive elements enclosed in such a manner as to prevent injury to

operators or maintenance personnel performing their normal duties.

(3) Each mixer shall be equipped with an individual motor and control, and with a conveniently located manual switch to prevent the mixer from being started in the usual manner while the machine is being serviced and cleaned.

(4) All electrical control stations shall be so located that the operator must be in full view of the bowl in its open position. Such controls, other than a stop switch, shall not be duplicated.

(5) All mixers with power and manual dumping arrangements shall be equipped with safety devices which shall:

(a) Engage both hands of the operator, when the agitator is in motion under power, and while the bowl is opened more than one-fifth of its total opening.

(b) Prevent the agitator from being started, while the bowl is more than one-fifth open, without engaging both hands of the operator;

(c) Permit the operator to have a full view of the bowl opening while he is in the act of maintaining operation of the agitator at any time while the bowl is more than one-fifth open.

(6) Mixers with power dumping devices shall be arranged so that the bowl opening cannot be closed beyond four-fifths of its total opening unless the operator maintains the control contact which causes the dump motor to complete the bowl closure. Alternatively the control may be so arranged that the operator must keep at least one hand engaged, by holding in a push button, during the entire closure of the mixing bowl.

(7) Mixers shall be provided with flour-gate operating mechanisms, ingredient openings, and water inlets, which can be conveniently manipulated by the operator from the normal area of activity (either platform or floor) without requiring abnormal reaching, or improvisations which might jeopardize his safety.

(8) Every mixer shall be equipped with a full enclosure over the bowl which is closed at all times while the agitator is in motion. Only minor openings in this enclosure, such as ingredient doors, flour inlets, etc., each representing less than 1 1/2 square feet in area, shall be capable of being opened while the mixer is in operation.

(9) No loose access doors and covers weighing more than 2 pounds shall be used on mixers. Such parts shall be hinged or otherwise held in proximity to the openings that they cover.

(10) Overhead covers or doors which are subject to accidental closure shall be counterbalanced to remain in an open position or provided with means to hold them open until positively released by the operator.

(11) Provision shall be made to bolt mixers solidly to the floor to prevent dislocation or excessive vibration. Open space between mixers and platforms which may endanger the operator shall be guarded.

(12) Mixers shall be installed only on substantial foundations which are capable of safely withstanding the live loads incurred in full-capacity mixing operations.

(13) Access for lubrication at all points shall be provided so as to avoid contact between the lubricating device or the operator's hands and any moving parts.

(14) Any device or mechanism used to return "sponges" to a mixer shall be so interlocked with the mixer as to prevent injury to the operator.

(15) No electrical pilot or control circuits shall be employed at a potential in excess of 240 volts.

(16) A motor-running overcurrent protective device shall be provided for each motor. Undervoltage protection shall be provided in all magnetic controllers.

(17) Positive means shall be provided to prevent application of pressure above the design maximum in all mixer cooling jackets.

(18) Valves and controls to regulate the coolant in mixer jackets shall be located so as to permit access by the operator without jeopardizing his safety.

[Order 74-17, § 296-302-03001, filed 5/6/74.]

WAC 296-302-03003 Vertical mixers. (1) Vertical mixers shall comply with WAC 296-302-03001 (1), (2), (3), (9) through (13), (15) through (17).

(2) Positive means shall be provided to prevent injury to the operator during speed-change manipulation.

(3) Bowl locking devices shall be of a positive type which require the attention of the operator for unlocking.

(4) Devices shall be made available for moving bowls weighing more than 80 pounds, with contents, into and out of the mixing position on the machine.

[Order 74-17, § 296-302-03003, filed 5/6/74.]

WAC 296-302-035 Dividers. (1) Pinch and shear points. All pinch points and shear points from reciprocating or rotating parts of the divider shall be enclosed or guarded, to protect the operator's hands and fingers from these hazards.

(2) Front guards. Guards at front of a divider shall be so arranged that the weight of dough can be adjusted without removing the guard.

(3) Rear of divider. The back of the divider shall have a complete cover to enclose all of the moving parts, or each individual part shall be enclosed or guarded to remove the separate hazards. The rear cover shall be provided with a limit switch in order that the machine cannot operate when this cover is open. The guard on the back shall be hinged so that it cannot be completely removed and if a catch or brace is provided for holding the cover open, it shall be designed so that it will not release due to vibrations or minor bumping whereby the cover may drop on an employee.

(4) Oil holes in knife. The oil holes in the knife at the back of the divider shall be of a maximum width opening of 1/4 inch so an employee's finger cannot go through the hole.

(5) Knife actuating arm. There shall be a saddle guard or other protective device on any elongated hole in the knife actuating arm at the back of the divider.

(6) Shear pins. Dividers shall be equipped with mechanical overload release devices such as shear pins.

[Order 74-17, § 296-302-035, filed 5/6/74.]

WAC 296-302-040 Moulders. (1) Hoppers. Mechanical feed moulders shall be provided with hoppers so designed and connected to the proofer that an employee's hands cannot get into the hopper where they will come in contact with the in-running rolls.

(2) Hand-fed moulders. Hand-fed moulders shall be provided with a belt-feed device or the hopper shall be extended high enough so that the hands of the operator cannot get into the feed rolls. The top edge of such a hopper shall be well rounded to prevent injury when it is struck or bumped by the employee's hand.

(3) Stopping devices. There shall be a stopping device within easy reach of the operator who feeds the moulder and another stopping device within the reach of the employee taking the dough away from the moulder.

(4) Cleanout holes. Machines shall be so designed or guarded that there is no shear point in close proximity to the cleanout holes.

(5) Rear of moulders. At the rear of moulders all revolving shafts shall have round corners or cylindrical surfaces, and all bolts shall be flush. Tie rods shall be far enough from revolving parts to prevent a shearing or pinching hazard.

(6) Adjustment crank. Where a removable crank is used to adjust the moulder for different sizes of loaf, brackets shall be provided on the side of the machine for holding the crank when it is not in use.

[Order 74-17, § 296-302-040, filed 5/6/74.]

WAC 296-302-045 Manually fed dough brakes. (1)

Top-roll protection. The top roll shall be protected by a heavy gage metal shield extending over the roll to go within 6 inches of the hopper bottom board. The shield may be perforated to permit observation of the dough entering the rolls.

(2) Emergency stop bar. An emergency stop bar shall be provided, so located that the body will press against it if the operator should fall forward, and this pressure shall positively open a circuit which will deenergize the drive motor in case of an emergency. In addition a magnetic, spring-set brake shall be deenergized at the same time, causing the rolls to stop instantly. The emergency stop bar shall be activated prior to each shift to check if it is functioning properly.

[Order 74-17, § 296-302-045, filed 5/6/74.]

WAC 296-302-050 Miscellaneous equipment. (1)

Proof boxes. All door locks shall be operable both from within and outside the box. Guide rails shall be installed to center the rack as it enters, passes through, and leaves the proof box.

(2) Fermentation room. Fermentation room doors shall have nonshatterable wire glass or plastic panels for vision through doors.

(3) Troughs. Troughs shall be mounted on antifriction bearing casters thus making it possible for the operator to move and direct the motion of the trough with a minimum of effort.

(4) Hand trucks.

(a) Casters shall be set back from corners to be out of the way of toes and heels, but not far enough back to cause the truck to be unstable.

(b) A lock or other device shall be provided to hold the handle in vertical position when the truck is not in use.

(5) Lift trucks. A lock or other device shall be provided to hold the handle in vertical position when the truck is not in use.

(6) Racks.

(a) Sharp splintered or rough corners and edges shall be eliminated.

(b) Racks shall be equipped with handles so located with reference to the frame of the rack that no part of the operator's hands extends beyond the outer edge of the frame when holding onto the handles.

(c) Antifriction bearing casters shall be used to give the operator better control of the rack.

(d) End guards shall be used at shelf levels on proofing racks.

(7) Conveyors.

(a) Wherever a conveyor passes over a main aisleway, regularly occupied work area, or passageway, the underside of the conveyor shall be completely enclosed to prevent broken chains or other material from falling in the passageway or work area.

(b) Stop bumpers shall be installed on all delivery ends of conveyors, wherever manual removal of the product carried is practiced.

(c) All conveyors shall have stop buttons at all operating stations. In addition, emergency stop bars or switches shall be installed at any machine infeed location fed by the conveyor where pinch points exist.

(8) Overhead rail systems.

(a) Handles for operating devices for trolley switches which hang less than 6 feet 8 inches from the floor shall be of pliable material.

(b) Floor scales. Nonshatterable transparent material shall be used to cover dials.

(9) Dough chutes. The entrance to the chute shall be guarded so as to protect the employee from falling into chute, stepping into chute, or tripping over too low an edge of the chute.

(10) Skids.

(a) All sharp corners or edges shall be eliminated on all metal skids.

(b) All edges and corners shall be protected on skids to prevent exposed splinters.

(11) Ingredient premixers, emulsifiers, etc.

(a) All top openings shall be provided with covers attached to the machines. These covers should be so arranged and interlocked that power will be shutoff whenever the cover is opened to a point where the operator's fingers might come in contact with the beaters.

(b) Portable electrical agitators for ingredient premixers shall have the attachment cord so wired that the agitator will be grounded whenever it is connected to a source of power.

(12) Chain tackle.

(a) All chain tackle shall be marked prominently, permanently, and legibly with maximum load capacity.

(b) All chain tackle shall be marked permanently, and legibly with minimum support specification.

(c) Safety hooks shall be used.

(13) Trough hoists, etc.

(a) All hoists shall be marked prominently, permanently, and legibly with maximum load capacity.

(b) All hoists shall be marked permanently and legibly with minimum support specifications.

(c) Safety catches shall be provided for the chain so that the chain will hold the load in any position.

- (d) Safety hooks shall be used.
- (14) Air-conditioning units.
 - (a) All sharp corners and edges shall be eliminated.
 - (b) On large units with doors to chambers large enough to be entered, all door locks shall be operable from both inside and outside.
- (15) Pan washing tanks.
 - (a) Counter-balanced hinged covers, or sliding covers, shall be provided.
 - (b) The surface of the floor of the working platform shall be maintained in nonslip condition.
 - (c) Working platforms shall be kept at least 32 inches below the top of the tank or guardrail.
 - (d) All electrical sockets in pan washing rooms shall be nonmetallic and keyless and other electrical equipment shall be moisture proof.
 - (e) Power ventilated exhaust hoods shall be provided over the tanks.
- (16) Pan washing machines. Sharp corners and edges shall be eliminated.
- (17) Cake depositors. All pinch points shall be eliminated, guarded, or shielded so that hands and arms cannot reach these pinch points while the machine is in operation.
- (18) Icing machines. All pinch points shall be eliminated, or provided with guards or shields so hands and arms cannot reach these pinch points while the machine is in operation.
- (19) Bread coolers, conveyor type.
 - (a) All pinch points shall be eliminated or guarded.
 - (b) Stop bumpers on all delivery ends of conveyors shall be installed wherever manual removal of the product carried is practiced.
- (20) Bread coolers, rack type.
 - (a) Guardrails shall be installed to the center rack as it enters and leaves the cooler.
 - (b) All door locks shall be operable from both within and outside the cooler.
- (21) Bread and cake boxes, trays, etc.
 - (a) Sharp corners and edges shall be eliminated on metal parts.
 - (b) All wooden corners and edges shall be protected to prevent splinters.
- (22) Doughnut machines. Separate flues shall be provided, (a) for venting vapors from the frying section, and (b) for venting products of combustion from the combustion chamber used to heat the fat.
- (23) Open fat kettles.
 - (a) The floor around kettles shall be maintained in nonslip condition.
 - (b) Fire extinguishing devices suitable for Class-B fires shall be provided. See general safety and health standards, WAC 296-24-590.
 - (c) Goggles or face shields shall be provided to prevent injuries from hot fat splashes.
 - (d) The top of the kettle shall be not less than 36 inches above floor or working level.
- (24) Steam kettles.
 - (a) Positive locking devices shall be provided to hold kettles in the desired position.

(1999 Ed.)

(b) Kettles with steam jackets shall be provided with safety valves in accordance with the ASME Pressure Vessel Code, section VIII, Unfired Pressure Vessels, 1968.

[Order 74-17, § 296-302-050, filed 5/6/74.]

WAC 296-302-05501 Slicers. (1) Sprockets, chains, and V-belt drives on slicers shall be completely enclosed.

(2) All slicing machines shall be provided with a mechanical device to push the last loaf through the slicer knives.

(3) The cover over the knife head of reciprocating-blade slicers shall be provided with an interlocking arrangement so that the machine cannot operate unless the cover is in place.

(4) On slicers with endless band knives, each motor shall be equipped with a magnet brake which operates whenever the motor is not energized. Each door, panel, or other point of access to the cutting blades shall be arranged by means of mechanical or electric interlocks so that the motor will be de-energized if all such access doors, panels, or access points are not closed.

(5) When it is necessary to sharpen slicer blades on the machine, a barrier shall be provided leaving only sufficient opening for the sharpening stone to reach the knife blades.

(6) Where pusher fingers attached to the feed chain enter the bed plate of the cross feed, the end guard shall be extended to cover the pinch point.

(7) Slicer wrapper conditions:

(a) Where the flight chain on the slicer turns under the bed plate on the crossfeed to the wrapper, a spring-hinged section of bed plate shall be provided so that there is no shear point between the flight chain and the bed plate.

(b) Wrapping and slicing machines obtained from separate manufacturers, shall be installed and connected so that the chains, sprockets, belts, and moving parts are guarded. Interconnections for the starting and stopping of such devices shall be employed.

(c) Mechanical control levers for starting and stopping both slicing machine conveyors and wrapping machines shall be extended or so located that an operator in one location can control both machines. Such levers should be provided wherever necessary, but these should be so arranged that there is only one station capable of starting the wrapping machine and conveyor assembly, and this starting station should be so arranged or guarded as to prevent accidental starting. The electric control station for starting and stopping the electric motor driving the wrapping machine and conveyor should be located near the clutch starting lever.

(d) The transfer chain shall be completely covered on all sides, not just on front and top.

[Order 74-17, § 296-302-05501, filed 5/6/74.]

WAC 296-302-05503 Wrappers. (1) Any hand wheel which may be provided in order to turn the wrapping machine over by hand and which may run continuously shall be a smooth, solid disk wheel.

(2) At the discharge end (or drive side) of the crossfeed conveyor there shall be either a one- or two-piece guard in front of the crossfeed chain.

(3) Electrical heaters on wrappers shall be protected by a cover plate properly separated or insulated from the heaters in

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order that accidental contact with this cover plate will not cause a burn to the operator.

(4) Electric wiring for the wrapper heaters shall be so arranged that a minimum number of wires are used to connect the movable heaters assembly to the permanent wiring of the machine. This wiring shall be heat-resisting type in accordance with the requirements of the National Electrical Code - 1971 Edition.

(5) Power-driven friction rollers used to feed paper into the wrapping machine shall be provided with a guard over the in-running nip point of the rubber rollers.

(6) The nip point, between the chain and sprocket of the loose wrap attachment, shall be completely enclosed or guarded on both sides in such a way that employee's fingers cannot get into this nip point.

(7) Sprocket, chain, and V-belt drives on wrappers shall be completely enclosed.

[Order 74-17, § 296-302-05503, filed 5/6/74.]

WAC 296-302-060 Biscuit and cracker equipment.

(1) Meal, peanut, and fig grinders.

(a) If the hopper is removable it shall be provided with an electric interlock so that the machine cannot be put in operation when the hopper is removed.

(b) Where grid guards cannot be used, feed conveyors to hoppers, or baffle-type hoppers, shall be provided. Hoppers in such cases shall be enclosed and provided with hinged covers, and equipped with electric interlock to prevent operation of the machine with the cover open.

(2) Sugar and spice pulverizers.

(a) All drive belts used in connection with sugar and spice pulverizers shall be grounded by means of metal combs or other effective means of removing static electricity. All pulverizing of sugar or spice grinding shall be done in accordance with NFPA 62-1967 (Standard for Dust Hazards of Sugar and Cocoa), NFPA 656-1959 (Standard for Dust Hazards in Spice Grinding Plants).

(b) Magnetic separators shall be provided to reduce fire and explosion hazards.

(3) Cheese, fruit, and food cutters. These machines shall be protected in accordance with the requirements of (1) of this section.

(4) Jam, icing, and marshmallow beaters of horizontal tub type. All top openings shall be provided with covers attached to the machines.

(5) Reversible dough brakes. Reversible brakes shall be provided with a guard or tripping mechanism on each side of the rolls. These guards shall be so arranged as to stop the machine or reverse the direction of the rolls so that they are outrunning if the guard is moved by contact of the operator.

(6) Cross-roll brakes. Cross-roll brakes shall be provided with guards that are similar in number and equal in effectiveness to guards on hand-fed brakes.

(7) Box- and roll-type dough sheeters.

(a) Sheeting rolls shall be guarded at the point where the dough enters the rolls so that the operator's fingers cannot get into the nip point.

(b) Hoppers for sheeters shall have an automatic stop bar or automatic stopping device along the back edge of the hopper. If construction does not permit location at the back edge,

the automatic stop bar or automatic stopping device shall be located where it will be most effective to accomplish the desired protection.

(8) Cutting and panning, embossing, peeling, bar, and frutana machines.

(a) Roll stands, other than hand fed, shall be guarded at the point where the dough enters the rolls so that the operator's fingers cannot get into the nip points.

(b) Guards shall be provided at each side of the cutter to prevent hands from getting under the cutter.

(c) Reciprocating panner heads shall be guarded to protect the operator from being caught between moving and stationary parts.

(d) Motor control buttons shall be located within view of the cutting head.

(9) Rotary, die machines, pretzel rolling, and pretzel-stick extruding machines. Dough hoppers shall have the entire opening protected with grid-type guards to prevent the employee from getting his hands caught in moving parts, or the hopper shall be extended high enough so that the operator's hands cannot get into moving parts.

(10) Band ovens. Band ovens shall be so arranged, or guarded, that the operator cannot get caught at the nip point between the band and the drive pulley or the take-up pulley, or between the oven conveyor and the oven frame.

(11) Wafer-cutting machines. These machines shall be so guarded that it will be impossible for employee's fingers or hands to come in contact with the saws or knives while feeding the machine.

(12) Pan cooling towers.

(a) Where pan cooling towers extend to two or more floors, a lockout switch shall be provided on each floor in order that

mechanics working on the tower may positively lock the mechanism against starting. Only one start switch shall be used in the motor control circuit.

(b) All unused sides of pan cooling tower conveyors shall be enclosed or effectively guarded to a height of 7 feet above each floor.

(c) Wherever a pan cooling tower conveyor passes through a floor, the opening shall be protected by a standard railing and toeboard as defined by the general safety and health standards, chapter 296-24 WAC, or by other equivalent protection.

(d) Wherever a pan conveyor passes over a main aisleway, regularly occupied work area, or passageway, the underside of the conveyor shall be completely enclosed to prevent pans, broken chains, or other material from falling in the aisleway, work area or passageway.

(e) Sprocket wheels of pan conveyors shall be enclosed so that accidental contact cannot be made at the point where the chain comes in contact with the sprocket.

(f) Wherever conveyor bars, flights, and attachments pass in opposite directions within 6 inches of each other, a sheet metal partition or screen with openings no larger than one-half inch shall be placed between the conveyor chains which run in opposite directions.

(13) Chocolate melting, refining, and mixing kettles. Each kettle shall be provided with a cover to enclose the top of the kettle. The bottom outlet of each kettle shall be of such

size and shape that the operator cannot reach in to touch the revolving paddle or come in contact with the shear point between the paddle and the side of the kettle.

(14) Caddie, cover, and box stitchers (wire stitchers). A guard shall be mounted on the stitching head to prevent operators from getting fingers caught between the stitching head and the clincher block.

(15) Carton-wrapping and bundling machines. The end seal drums on carton and bundling machines shall be provided with guards.

(16) Carton and lining feeding machines. Cutting knives shall be provided with a hinged hood to cover the knives. These guards shall be electrically interlocked to stop the machine if they are removed.

(17) Peanut cooling trucks. Mechanically operated peanut cooling trucks shall have a grid-type cover over the entire top.

[Order 74-17, § 296-302-060, filed 5/6/74.]

WAC 296-302-065 Ovens—Scope and application.

All sections of this chapter which include WAC 296-302-065 in the section number, apply to ovens.

[Order 74-17, § 296-302-065, filed 5/6/74.]

WAC 296-302-06501 General location. (1) Ovens shall be located with due regard to the possibility of fire resulting from overheating or from the escape of gas or fuel oil and the possibility of injury to persons resulting from explosions.

(2) Ovens shall be built on noncombustible foundations; excepting that where unusual circumstances require that an oven be placed on a combustible floor, the sole of the oven itself shall be insulated and shall be separated from the floor by a ventilated air space of at least 3 inches. In no case shall the temperature of a combustible floor beneath an oven be permitted to exceed 160°F.

(3) Insulation shall be used in the crown of any oven, and the space above this crown shall be ventilated, to prevent the temperature of any combustible ceilings from rising above 200°F.

(4) Where oven ducts or stacks pass through combustible walls or ceilings, sufficient clearance and insulation shall be provided to keep the temperature of combustible material below 160°F.

(5) Columns or structural members of a building shall not pass through an oven. When such columns or structural members are closer than 6 inches to the inner shell of an oven, fireproof material shall be used and insulated in such a way that the temperature of the column or structural member will be kept below 160°F.

(6) Ovens shall be located so as to be accessible from all sides and adequately spaced to permit the proper functioning of explosion vents.

(7) Ovens shall be located so that possible fire or explosion will not expose groups of persons to possible injury. For this reason ovens shall not adjoin lockers, lunch or sales rooms, main passageways, or exits.

[Order 74-17, § 296-302-06501, filed 5/6/74.]

(1999 Ed.)

WAC 296-302-06503 General requirements. (1) Protecting devices shall be maintained and kept in working order.

(2) All safety devices on ovens shall be inspected at intervals of not less than twice a month by an especially appointed, properly instructed bakery employee, and not less than once a year by representatives of the oven manufacturers.

(3) Protection of gas pilot lights shall be provided when it is impracticable to protect the main flame of the burner and where the pilot flame cannot contact the flame electrode without being in the path of the main flame of the burner.

(a) Failure of any gas pilot shall automatically shut off the fuel supply to the burner.

(b) Ovens with multiple burners shall be equipped with individual atmospheric pilot lights where there is sufficient secondary air in the baking chamber and where gas is available, or else each burner shall be equipped with an electric spark-type ignition device.

(4) Burners of a capacity exceeding 150,000 b.t.u. per hour equipped with electric ignition shall be protected in addition by quick-acting combustion safeguards.

(a) The high-tension current for any electric spark-type ignition device shall originate in a power supply line which is interlocked with the fuel supply for the oven in such a way that in case of current failure both the source of electricity to the high-tension circuits and the fuel supply shall be turned off simultaneously.

(b) All electric circuits in connection with ignition systems on ovens shall comply with the National Electrical Code 1971 Edition.

(c) Combustion safeguards used in connection with electric ignition systems on ovens shall be so designed as to prevent an explosive mixture from accumulating inside the oven before an ignition has taken place.

(5) When fuel is supplied and used at line pressure, safety shutoff valves shall be provided in the fuel line leading to the burner.

(a) When fuel is supplied in excess of line pressure, safety shutoff valves shall be provided in the fuel line leading to the burners, unless the fuel supply lines are equipped with other automatic valves which will prevent the flow of fuel when the compressing equipment is stopped.

(b) The safety shutoff valve shall be positively tight and shall be tested at least twice monthly.

(c) Packing glands shall be designed so that the valve will not be made inoperative by excessive tightening of the packing gland.

(d) Electrically operated safety shutoff valves shall be normally closed and not depend on electricity for shutting off the fuel supply.

(e) A safety shutoff valve shall require manual operation for reopening after it has closed, or the electric circuit shall be so arranged that it will require a manual operation for reopening the safety shutoff valve.

(f) Manual reset-type safety shutoff valves shall be so arranged that they cannot be locked in an open position by external means.

(g) Where blowers are used for supplying the air for combustion the safety shutoff valve shall be interlocked so that it will close in case of air failure.

(h) Where gas or electric ignition is used, the safety shutoff valve shall close in case of ignition failure. On burners equipped with combustion safeguards, the valve shall close in case of burner flame failure.

(6) One main, manually operated, fuel shutoff valve shall be provided on each oven, and shall be located ahead of all other valves in the system.

(7) All individual gas or oil burners with a heating capacity over 150,000 b.t.u. per hour shall be protected by a safeguard which is actuated by the flame and which will react to flame failure in a time interval not to exceed 2 seconds. All safeguards, once having shut down a gas or oil burner, shall require manual resetting and starting of the burner or burners.

(8) Any space in an oven (except direct fired ovens) which could be filled with an explosive mixture shall be protected by explosion vents. Explosion vents shall be made of minimum weight consistent with insulation.

(a) Explosion doors which have a weight shall be attached by chains or similar means to prevent flying parts from injuring the personnel in case of an explosion.

(b) Where explosion vents are so located that flying parts or gases might endanger the personnel working on or near the oven, internal or external protecting means shall be provided in the form of heavily constructed shields or deflectors made from noncombustible material.

(c) Specifically exempted from the provisions of these standards as contained in (8)(a) and (b) of this section are heating systems on ovens in which the fuel is admitted only to enclosed spaces, which shall have been tested to prove that their construction will resist repeated explosions without deformation.

(9) Flues and dampers.

(a) All ovens (except electrically heated) shall be properly and firmly connected to an active chimney or flue of ample size to carry away the flue gases.

(b) The chimney shall be preinspected after installation or repair to determine whether it is in suitable condition.

(c) The flue pipe or breeching shall be properly supported in all cases.

(d) Means shall be employed which will prevent the flue pipe or breeching from entering beyond the inner wall of the chimney flue.

(e) Flue pipe shall be cemented or otherwise sealed to the chimney wall so as to prevent infiltration of air.

(f) A flue damper or other equivalent means for regulating draft shall be installed on each oven, the proper operation of which depends on natural draft.

(g) Dampers, where used, shall be equipped with accessibly located minimum and maximum stops. The minimum stop for dampers shall be adjusted to obtain sufficient air for combustion at the minimum oven output. Where stack dampers are used in connection with oil- or gas-fired ovens, they shall be equipped with means to turn the burner off when the damper is closed.

(10) Where the initial pressure of the fuel is lower than the air pressure used for combustion, check valves shall be installed in the fuel line to prevent air from backing up into

the fuel lines. For instance, in gas burner apparatus, which uses air at pressures exceeding the gas service pressure, a check valve shall be provided in the gas line next to the mixing device.

(11) Where the gas supply pressure is substantially higher than that at which the burners of an oven are designed to operate, a gas pressure regulator shall be employed.

(a) Gas pressure regulators, where used, shall maintain the gas pressure to the manifold within 10 percent of the operating pressure from maximum to minimum consumption rates.

(b) Regulators shall be of the spring-loaded, dead-weight, or pressure-balanced type. Spring- or weight-loaded regulators shall have springs or weights covered by suitable housing. Under no circumstances shall a weight and lever type of regulator be used.

(c) A gas pressure regulator, requiring access to atmosphere for successful operation, shall be vented to the outer air.

(d) A relief valve shall be placed on the outlet side of gas pressure regulators where gas is supplied at high pressure. The discharge from this valve shall be piped to the outside of the building.

(12) All chambers which have to be connected to the atmosphere, but are separated from any gaseous or other volatile fuel by a flexible membrane, as, for instance, a diaphragm, bellows, etc., shall be connected by a pipe of at least one-half inch size to the outside atmosphere. The outside end of this pipe shall be protected against flooding or accidental plugging by ice formation, insects, or other causes, by providing a "tee" with double elbow connections pointing downwards at the top of the pipe, and screened outlets. Where several of such chambers are used in close proximity, a common vent line may be used.

(13) Where accumulation of dust in the air supply might affect the proper functioning of mixing devices and burners, the air supply inlet shall be equipped with suitable air filters. A standby filter should be available to permit interchanging filters for cleaning purposes.

[Order 74-17, § 296-302-06503, filed 5/6/74.]

WAC 296-302-06505 Construction. (1) Structural parts of ovens shall be protected against corrosion or deterioration.

(2) Roofs and other parts of ovens shall be structurally strong enough to support the weight of persons who may be required to climb on top of ovens or inside of them.

[Order 74-17, § 296-302-06505, filed 5/6/74.]

WAC 296-302-06507 Safeguards of mechanical parts.

(1) Emergency stop buttons shall be provided on mechanical ovens near the point where operators are stationed.

(2) All piping at ovens shall be tested to be gastight.

(a) Soldered pipe joints shall not be permitted in connection with ovens. Pipe joints may be either screwed, flanged, or welded, in connection with ovens where such pipes carry fuel or steam.

(b) All pipe and fittings used shall be of such schedule which will safely carry the pressure and be clear and free from cutter burrs and defects in structure or threading.

(3) Main shutoff valves, operable separately from any automatic valve, shall be provided to permit turning off the fuel or steam in case of an emergency.

(a) Main shutoff valves shall be located so that explosions, fires, etc., will not prevent access to these valves.

(b) Main shutoff valves shall be locked in the closed position when persons must enter the oven or when the oven is not in service.

[Order 74-17, § 296-302-06507, filed 5/6/74.]

WAC 296-302-06509 Gas-burning systems. (1) Liquified petroleum gas shall be stored and distributed in accordance with the requirements of the general safety and health standards, chapter 296-24 WAC.

(b) Inspirators on atmospheric (low-pressure) gas-burning systems shall be so constructed and machined as to ensure correct alignment of the gas jet with the axis of the inspirator. Air adjustments or shutters on inspirators on atmospheric gas-burning systems shall either be permanently fixed or else provided with a locking device to positively prevent accidental change of setting. The shutter shall be so located that adjustments can be made when the oven is in normal operating condition.

(3) Dampers controlling the draft on ovens equipped with atmospheric gas-burning systems shall be interconnected with the gas supply so that no gas can be admitted to the burners if the damper is closed.

(a) Atmospheric pipe burners extending into the baking chamber of ovens fired with atmospheric gas-burning systems shall have secondary air ducts installed below each burner and extending over its full length. Air inlets for these ducts shall be placed outside the baking chamber.

(b) Stack dampers on ovens equipped with atmospheric gas-burning systems shall have a hole of the following diameter:

Diameter of flue	Diameter of opening
3 to 5	1/2
6 to 10	1
11 to 15	1 1/2

Dimensions given in inches.

(4) Nozzle or blast burners on atmospheric gas-burning systems shall be equipped with gas pilots or electric ignition; with the exception that burners operated on a maximum-minimum flame or modulating principle which are equipped with quick acting combustion safeguards actuated by the main burner flame may be equipped with automatic or hand torch ignition to be used for initial lighting only.

(5) Burners of the perforated pipe, ribbon, slot, tip, or similar types, having many individual ports, shall be capable of maintaining a stable flame over the entire length (or surface) of the burner throughout the turndown range and under all draft conditions which may arise in the operation of the oven, unless ignition of gas from every port shall immediately result from the ignition of gas at any single port, when gas is supplied to the burner at the highest and lowest rating of the burners.

(6) Premixed gas burners shall be so designed that the burner will not backfire or blow off within the operating range of the burner.

(a) Multiple port burners, such as ribbon, strip, or tip burners, when used on premixed gas systems, shall be capable of instant ignition of the burner over its entire length when operated within the proper range of the burner, either in a normal or steam-laden oven atmosphere or under any other oven conditions which might extinguish the flame.

(b) Where a number of premixed gas burners are connected to a single premixing device, each burner shall be equipped with electric or gas ignition.

(7) High-pressure inspirators (using gas at pressures exceeding 1 p.s.i.) shall be so constructed and machined as to insure perfect alignment of the gas jet with the axis of the inspirator.

(a) No high-pressure inspirator shall be installed with a valve or other obstruction between the inspirator and the burner.

(b) Each high-pressure inspirator shall have a gas adjustment consisting of a fixed replaceable orifice or an adjustable orifice. When an adjustable orifice is used, the adjusting screw shall be protected by a gas-tight plug.

(c) Air adjustments on high-pressure inspirators shall be provided with positive locking means.

(d) High-pressure inspirators shall be so located that air adjustments can be made during the operation of the oven.

(e) High-pressure inspirators shall be mounted in such a position that should a backfire occur, it cannot injure the operator or ignite any combustible material.

(f) High-pressure inspirators used on gas-burning systems, which are supplied under pressure with a partial mixture of air and gas instead of straight gas, shall not be used unless the amount of air mixed with the gas is sufficiently low to keep the mixture rich enough to be above the upper explosive limit.

(g) Low-pressure proportioning inspirating sets (using air at pressures from one-half to 1 1/2 p.s.i. and gas at or about atmospheric pressure) shall be equipped with a positive locking device on the adjustment for setting the gas-air ratio.

(8) Low-pressure proportioning inspirators equipped with zero governors, which do not compensate for any change in resistance in the mixture pipe, shall be installed so that there is no valve or other obstruction between the inspirators and the burners. Diaphragm air spaces of governors on low-pressure proportioning inspirating sets shall be vented to the outside of the building.

(9) Two-pipe systems: No valve or other obstruction shall be placed between the mixing valve and the burners on any two-pipe system which uses air and gas under pressure, unless the mixing valve is equipped with a device which automatically will prevent excessive pressure rise in the mixture pressures. Two-pipe systems shall be equipped with means for cleaning the air and gas before they enter the mixing valve.

[Order 74-17, § 296-302-06509, filed 5/6/74.]

WAC 296-302-06511 Gas mixing machines. (1) All burners supplied with complete mixture from the machine shall be equipped with flash and flame arrestors equipped with automatic shutoff valves actuated by heat. These controls shall be installed as close to the burners as practical and also at the outlet of the premixing machine ahead of the indi-

vidual burner shutoffs to prevent the flame from reaching the mixture supply pipe.

(a) The main mixture lines and the gas machine proper shall be amply protected against fire or explosion hazard by flashback arrestors and relief vents or soffheads located outside the building. Some gas mixing machines are used for partially premixing gas and air and supplying this mixture to high-pressure inspirators where additional air is entrained. If the gas-air ratio is such that the mixture remains so rich as to be above the upper explosive limit over the entire range of the machine, flash arrestors or explosion vents are not required. Positive means shall be provided which will prevent any such gas mixing machine from producing an explosive mixture.

(b) All diaphragm or similar chambers shall be connected to the atmosphere outside of the building.

(c) An automatic safety shutoff valve shall be provided in the gas line leading to the mixing valve which will close the gas supply in case the suction disappears at the compressor inlet or the current to the compressor is shutoff.

(d) Air inlets to gas mixing machines shall be piped to a location outside the building and shall be located at a point protected against dust.

(2) No valve or obstruction shall be installed between mixing blowers and burners.

(a) Mixing blowers shall be so constructed that they will supply a mixture of air and gas that will not blow off or backfire over the entire range of adjustments.

(b) Mixing blowers shall be provided with a pressure regulator in the gas line at the inlet to the mixing valve (to prevent variations in the air-gas ratio).

(c) Housings of mixing blowers shall be constructed to withstand any possible internal explosion.

(d) Mixing blowers shall be provided with an automatic safety shutoff valve in the gas line leading to the blower, which the safety shutoff valve will close in case of failure of either gas pressure or electric current.

[Order 74-17, § 296-302-06511, filed 5/6/74.]

WAC 296-302-06513 Oil-burning equipment. (1) The storage and distribution of fuel oil in bakeries shall be arranged according to reference NFPA 31-1968 Standard for Installation of Oil Burning Equipment.

(2) Oil burners shall be of a type approved by Underwriters' Laboratories, Inc. (See WAC 296-24-006, of the general safety and health standards.)

(a) Each oil burner shall be equipped with an electric ignition or gas pilot.

(b) Oil burners shall be protected against flame failure and overflowing of oil by a quick-acting combustion safeguard operated by the main burner flame. The time interval between flame failure and fuel shutoff shall be short enough to prevent a dangerous accumulation of an explosive mixture or the entry of a dangerous amount of fuel oil into the heating system; with the exception that on ovens requiring 150,000 b.t.u. per hour or less any combustion safeguard listed by the Underwriters Laboratories, Inc., may be used. (See WAC 296-24-006, of the general safety and health standards.)

(c) The shutting off of the fuel supply shall be accomplished by stopping the individual burner pump equipped with a pressure cutoff valve, or by closing a suitable valve.

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(d) Oil-fired ovens shall have dampers so arranged that a small amount of air is passed through the furnace at all times.

(e) Oil burners capable of being withdrawn from the furnace (for adjustment, etc.) shall be provided with an interlock which will prevent the burner from starting when in the withdrawn position.

(f) Preheating of oil, where necessary, shall be done by steam, hot water, or electric heater, and shall be thermostatically controlled. Heaters shall be substantially constructed with all joints made oil tight. Thermometers shall be installed at accessible locations to indicate the temperature of the heated oil. Heaters shall be bypassed or provided with means to prevent abnormal pressure.

(g) Oil burners equipped with mechanical means for supplying air shall have an interlock between the air pressure and the oil supply so that the burner cannot operate unless air for proper combustion is available.

(3) High-pressure atomizing oil burners shall be provided with a pressure cutoff valve between the pump and the nozzle.

(4) Air atomizing burners equipped with maximum-minimum or modulating controls, and which are arranged to have the ignition turned off after initial lighting has been accomplished, shall be equipped with a quick-acting flame safeguard directly actuated by the main flame of the burner.

(5) Mechanical atomizing burners of the rotary type shall be operated on the on-off principle and shall be equipped with safeguards actuated by the main flame.

(6) Evaporator-type burners shall be installed in such a way that provision is made to open the draft damper before oil can be admitted to the burners.

(7) Burners supplied by "vapofiers" shall be equipped with a protected gas or electric pilot. In combination vapofier-gas heating systems, the burner shall be protected in accordance with the requirements of WAC 296-302-06509.

[Order 74-17, § 296-302-06513, filed 5/6/74.]

WAC 296-302-06515 Solid-fuel firing equipment. (1) In solid-fuel firing systems proper draft shall be maintained at the stack as long as there is fuel in the furnace. All breachings and flues shall be kept in a tight and clean condition. Solid-fuel firing systems using forced draft shall have the air supply to the ash pit interconnected with the furnace in such a way that the air pressure is shut off when the furnace door is opened.

(2) Mechanical stokers.

(a) Fuel feed and air supply to mechanical stokers shall be interlocked in such a way that fuel cannot be fed without sufficient air being available.

(b) Dampers in mechanical-stoker fired systems shall be interlocked with the stoker in such a way that the stoker cannot be started unless the damper is open.

[Order 74-17, § 296-302-06515, filed 5/6/74.]

WAC 296-302-06517 Electrical heating equipment. (1) All electrical equipment shall be built and installed according to the National Electrical Code - 1971 edition.

(2) Open heating elements inside the baking chamber shall be guarded against accidental touching by the product

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being baked, by the body of the operator, or by current-conducting implements which may be used.

(3) A main disconnect switch or circuit breaker shall be provided. This switch or circuit breaker shall be so located that it can be reached quickly and safely. The main switch or circuit breaker shall have provisions for locking it in the open position if any work on the electrical equipment or inside the oven must be performed.

[Order 74-17, § 296-302-06517, filed 5/6/74.]

WAC 296-302-06519 Direct-fired ovens. (1) Direct-fired ovens shall be safeguarded against failure of fuel, air, or ignition.

(2) To prevent the possible accumulation of explosive gases from being ignited after a shutdown, all direct-fired ovens with a heating capacity over 150,000 b.t.u. per hour shall be ventilated before the ignition system, combustion air blower, and the fuel can be turned on. The prevention shall insure at least four complete changes of atmosphere in the baking chamber by discharging the oven atmosphere to the outside of the building and entraining fresh air into it. The prevention shall be repeated whenever the heating equipment is shut down by a safety device.

[Order 74-17, § 296-302-06519, filed 5/6/74.]

WAC 296-302-06521 Direct recirculating ovens. (1) Each circulating fan in direct recirculating ovens shall be interconnected with the burner in such a manner that the fuel is shut off by a safety valve when the fan is not running.

(2) The flame of the burner or burners in direct recirculating ovens shall be protected by a quick-acting flame-sensitive safeguard which will automatically shut off the fuel supply in case of burner failure.

(3) Direct recirculating ovens shall be equipped with ventilating devices.

(4) Fans in direct recirculating ovens shall be constructed of materials suitable for the temperatures at which they will operate and designed with an ample safety factor to prevent rupture of the wheel.

(5) Fan wheel in direct recirculating oven shall be protected against direct impingement of the flame of the burner or burners.

(6) Direct recirculating ovens, and particularly fans in and on such ovens, shall be protected from overheating by means of a temperature limiting device.

(7) When the burner or burners on direct recirculating ovens are mounted at elevated positions permanent steps shall be provided for safe and convenient access to the burner or burners.

[Order 74-17, § 296-302-06521, filed 5/6/74.]

WAC 296-302-06523 Flue-type ovens. (1) Flue-type ovens shall be operated in such a way that less than atmospheric pressure is maintained in the flues.

(2) Gas burners in flue-type ovens shall be protected against flame failure.

(3) Oil burners on flue-type ovens shall be equipped with combustion safeguards as listed by the Underwriters Laboratories, Inc.

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(4) Solid-fuel stoker-fired flue-type ovens shall have the stack damper interlocked with the stoker so that the stoker cannot be operated when the damper is closed.

[Order 74-17, § 296-302-06523, filed 5/6/74.]

WAC 296-302-06525 Indirect-fired multiple burner ovens. (1) Indirect-fired multiple-burner ovens shall be equipped with safety shutoff valves which are interlocked with the ignition system, the air pressure and the gas pressure.

(2) Parts of enclosures reaching through the wall of indirect-fired multiple-burner ovens, and observation windows on such ovens, shall be tested at least once each year with repeated explosions, and afterward inspected for leaks.

[Order 74-17, § 296-302-06525, filed 5/6/74.]

WAC 296-302-06527 Steam-tube ovens. Steam-tube ovens shall be protected against overfiring (firing at an excessive rate) and overheating (heating to excessive temperatures) by devices which control the maximum amount of fuel admitted to the furnace and the maximum permissible temperature in the baking chamber.

[Order 74-17, § 296-302-06527, filed 5/6/74.]

WAC 296-302-06529 Indirect recirculating ovens. (1) Indirect recirculating ovens shall have all oil and gas burners equipped with quick-acting flame sensitive combustion safeguards.

(2) Duct systems in indirect-recirculating ovens shall be protected by explosion vents having a minimum total area of 1 square foot of vent to 15 cubic feet of total duct volume. These explosion vents shall be so located that they will not release hot gases or flying parts in the direction of an operator.

(3) Duct systems (in ovens) operating under pressure shall be tested for tightness in the initial starting of the oven and also at intervals not farther apart than 6 months.

(4) Fans and other parts in indirect recirculating ovens shall comply with requirements as listed under WAC 296-302-06521.

[Order 74-17, § 296-302-06529, filed 5/6/74.]

WAC 296-302-06531 Electric ovens. Electric ovens shall be installed, operated, and maintained in accordance with the National Electrical Code - 1971 edition.

[Order 74-17, § 296-302-06531, filed 5/6/74.]

**Chapter 296-303 WAC
SAFETY STANDARDS FOR LAUNDRY
MACHINERY AND OPERATIONS**

WAC	
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296-303-030 Moving parts.
296-303-040 Starting and stopping devices.

WAC 296-303-010 Laundry machinery and operations—Scope and application. This chapter applies to moving parts of equipment used in laundries and to conditions peculiar to this industry, with special reference to the point of operation of laundry machines. This chapter does not apply to dry-cleaning operations.

[Order 74-18, § 296-303-010, filed 5/6/74.]

WAC 296-303-01001 General industrial safety standards. (1) General. These standards shall be augmented by the Washington state general safety and health standards, and any other regulations of general application which are or will be made applicable to all industries.

(2) Additional requirements. The employer shall comply with the provisions of the standards referenced in this section. In the event of any conflict between this section and WAC 296-303-015 through 296-303-040, the requirements of WAC 296-303-015 through 296-303-040 shall apply. The provisions of this chapter shall prevail in the event of conflict with, or duplication of, provisions contained in chapter 296-24 and 296-62 WAC.

(a) Industrial lighting. American National Standard Practice for Industrial Lighting, ANSI A11.1-1965 (R-1970).

(b) Floor and wall openings, railings, and toeboards. American National Standard Safety Requirements for Floor and Wall Openings, Railings, and Toeboards, ANSI A13.1-1956.

(c) Identification of piping systems. American National Standard Safety Standard for Mechanical Power Transmission Apparatus, ANSI A13.1-1956.

(d) Mechanical power transmission apparatus. American National Standard Safety Standard for Mechanical Power Transmission Apparatus, ANSI B15.1-1971.

(e) Pressure piping—Power piping. American National Standard Code for Pressure Piping—Power Piping, ANSI B31.1.0-1967. Addenda to the American National Standard Code for Pressure Piping—Power Piping, ANSI B31.1.0a-1969.

(f) Sanitation. American National Standard Requirements for Sanitation in Places of Employment, ANSI Z4.1-1968.

(g) Local exhaust systems. American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z9.2-1960.

(h) Gas appliances and gas piping. American National Standard for the Installation of Gas Appliances and Gas Piping, ANSI Z21.30-1964.

(3) WAC 296-24-006 through 296-24-012 of the general safety and health standards, chapter 296-24 WAC, shall apply where applicable to this industry.

[Order 74-18, § 296-303-01001, filed 5/6/74.]

WAC 296-303-01003 Definitions. (1) "Laundry" means an establishment wherein the washing, ironing, or other finishing of clothes, or any other textiles is done, but excluding printing, bleaching, dry cleaning, or dyeing of clothes or other textiles.

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(2) "Marking machine" means a power-driven machine used for marking clothes or other textiles.

(3) "Washing machine" means a power-driven machine used for washing clothes or other textiles. It generally consists of a stationary case or shell inside of which is a revolving perforated cylinder.

(4) "Extractor" means a power-driven centrifugal machine used for removing surplus moisture from clothes or other textiles by centrifugal action.

(5) "Wringer" means one or more power-driven rolls used for removing surplus moisture from clothes or other textiles.

(6) "Starch mixer" means a power-driven machine used for mixing or processing starch.

(7) "Starching machine" means a power-driven machine used for the starching of clothes or other textiles.

(8) "Drying tumbler" means a machine within which clothes or other textiles are dried by air, and which usually consists of an enclosure inside of which is a revolving cylinder.

(9) "Shaker" (clothes tumbler) means a revolving cylinder used for shaking out clothes or other textiles.

(10) "Drying room" means an enclosure used for drying clothes or other textiles, and containing any power-driven mechanism.

(11) "Dampening machine" means a machine used for dampening clothes or other textiles.

(12) "Ironer" means a hand- or power-operated machine, with one or more rolls or heated surfaces in contact, used for ironing or smoothing clothes or other textiles.

(13) "Shaping machine" means a power-driven machine used to shape, mold, or otherwise finish clothes or other textiles; this term shall also include shaping tables, stands, or shelves upon which the machine may be mounted.

(14) "Sewing machine" means a machine used for sewing or stitching clothes or other textiles.

(15) "Guarded" means covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers or casings, barrier rails, safety bars, or screens, to eliminate the possibility of accidental contact with, or dangerous approach by, persons or objects.

(16) "Enclosed" means that the object or equipment or part thereof is so guarded that accidental contact at the point of danger, during the regular operation of the equipment, is not possible.

(17) "Safety interlock" means a device that will prevent the operation of the machine while the cover or door is open or unlocked and will hold the cover or door closed and locked while the basket or cylinder is in motion.

(18) "Moving parts" means gears, sprockets, revolving shafts, clutches, belts, pulleys, or other revolving or reciprocating parts that are attached to, or form an integral part of, a machine.

(19) "Power transmission" pertains to equipment such as shafting, gears, belts, pulleys, or other parts used for transmitting power to the machine, and shall include prime movers.

(20) "Prime movers" includes steam, gas, oil, and air engines or motors, and steam and hydraulic turbines.

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(21) "Point of operation" means the point or points at which clothes or other textiles are inserted or manipulated in the operation of the machine.

[Order 74-18, § 296-303-01003, filed 5/6/74.]

WAC 296-303-020 Point-of-operation guards—Scope and application. All sections of this chapter which include WAC 296-303-020 in the section number apply to point-of-operation guards.

[Order 74-18, § 296-303-020, filed 5/6/74.]

WAC 296-303-02001 Washroom machines. (1) Marking machine. Each power marking machine shall be equipped with a spring-compression device of such design as to prevent injury to fingers, should they be caught between the marking plunger and platen; or the marking machine shall be equipped with a control mechanism that will require the simultaneous action of both hands to operate the machine; or there shall be a guard that will act as a barrier in front of, and which will prevent the operator's fingers from coming into contact with the marking plunger.

(2) Washing machine.

(a) Each washing machine shall be equipped with an interlocking device that will prevent the inside cylinder from moving under power when the outer door on the case or shell is open, and will also prevent the door from being opened while the inside cylinder is in motion. This device should not prevent the movement of the inner cylinder under the action of a hand-operated mechanism or under the operation of an "inching device."

(b) Each washing machine shall be provided with means for holding open the doors or covers of inner and outer cylinders or shells while being loaded or unloaded. Spring loaded devices are an acceptable means.

(3) Extractor.

(a) Each extractor shall be equipped with a metal cover.

(b) Each extractor shall be equipped with an interlocking device that will prevent the cover from being opened while the basket is in motion, and will also prevent the power operation of the basket while the cover is not fully closed and secured. This device should not prevent the movement of the basket by hand to ensure an even loading.

(c) Each extractor shall also be effectively secured in position on the floor or foundation so as to eliminate unnecessary vibrations, and shall not be operated at a speed greater than that given in the manufacturer's rating, which shall be stamped on the inside of the basket where it is easily visible, in letters not less than one-fourth inch in height. The maximum permissible speed shall be given in revolutions per minute.

(d) Each engine individually driving an extractor shall be provided with an engine stop approved as specified in WAC 296-24-006, of the general safety and health standards, and a speed-limit governor. It is suggested that where an extractor is driven by a direct-current motor a "no field" release be installed to prevent overspeed, which may result from an open or broken field.

(4) Power wringer. Each power wringer shall be equipped with a safety bar or other guard across the entire front of the feed or first pressure rolls, so arranged that the

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striking of the bar or guard by the hand of the operator or other person will stop the machine.

[Order 74-18, § 296-303-02001, filed 5/6/74.]

WAC 296-303-02003 Starching and drying machines.

(1) Starching machine (cylinder or box type). Each starching machine, cylinder or box type, shall be enclosed or guarded so as to prevent the operator or other person from coming into accidental contact with the cylinder or box while the machine is in motion.

(2) Drying-room fan. Each drying-room fan, any part of which is within 7 feet of the floor or working platform, shall be guarded with wire mesh or screen of not less than No. 16 gauge, the openings of which will reject a ball one-half inch in diameter.

(3) Drying tumbler.

(a) Each drying tumbler shall be equipped with an interlocking device that will prevent the inside cylinder from moving under power when the outer door on the case or shell is open, and also prevent the door from being opened while the inside cylinder is in motion. This device should not prevent the movement of the inner cylinder under the action of a hand-operated mechanism or under the operation of an inching device.

(b) Each drying tumbler shall be provided with means for holding open the doors or covers of inner and outer cylinders or shells while being loaded or unloaded.

(4) Shaker (clothes tumbler).

(a) Each shaker or clothes tumbler of the single-cylinder type shall be equipped with a device that will automatically prevent the tumbler from moving while the door is open.

(b) The tumbler shall also be enclosed or guarded so as to prevent accidental contact by the operator or other person while the machine is in motion.

(c) Each shaker or clothes tumbler of the double-cylinder type shall be equipped with an interlocking device that will prevent the inside cylinder from moving when the outer door on the case or shell is open and will also prevent the door from being opened while the inside cylinder is in motion. This device should not prevent the movement of the inner cylinder under the action of a hand-operated mechanism or under the operation of an inching device.

(d) Each shaker or clothes tumbler of the double-cylinder type shall be provided with means for holding open the doors or covers of inner and outer cylinders or shells while being loaded or unloaded.

(5) Exception. Provisions of (3), (4)(a), (c) and (d) of this section shall not apply to shakeout or conditioning tumblers where the clothes are loaded into the open end of the revolving cylinder and are automatically discharged out of the opposite end.

[Order 74-18, § 296-303-02003, filed 5/6/74.]

WAC 296-303-02005 Finishing machines. (1) Dampening machine. Each roll-dampening machine shall be so equipped that the rolls will be entirely enclosed and so arranged as to prevent the fingers of the operator or other person from being caught between the rolls. This may be accomplished by:

(a) A slot or hopper;

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(b) A rod or strip located directly in front of the feed and extending the full length of the rolls.

(2) Ironer.

(a) Each flat-work or collar ironer shall be equipped with a safety bar or other guard across the entire front of the feed or first pressure rolls, so arranged that the striking of the bar or guard by the hand of the operator or other person will stop the machine. The pressure rolls shall be covered or guarded so that the operator or other person cannot reach into the rolls without removing the guard. This may be either a vertical guard on all sides or a complete cover. If a vertical guard is used, the distance from the floor or working platform to the top of guard shall be not less than six feet.

(b) Each body-type ironer, roll or shoe type, including sleeve and band ironers, shall be equipped with a safety bar or other guard across the entire length of the feed roll or shoe, so arranged that the striking of the bar or guard by the hand of the operator or other person will stop the machine. The hot roll or shoe shall also be covered in such a way that the operator or other person cannot come into contact with the heated surfaces.

(c) Each combined rotary-bosom and coat ironer shall be equipped with a safety bar or other guard across the entire length of the feed roll or shoe, so arranged that the striking of the bar or guard by the hand of the operator or other person will stop the machine. The hot roll or shoe shall also be covered in such a way that the operator or other person cannot come into contact with the heated surfaces.

(d) Each ironing press (excluding hand or foot powered ones) shall be equipped with a guard or means that will prevent the fingers of the operator or other person from being caught between the ironing surfaces.

[Order 74-18, § 296-303-02005, filed 5/6/74.]

WAC 296-303-02007 Miscellaneous machines and equipment. (1) Sewing machine. Each sewing machine shall be equipped with a guard permanently attached to the machine, so that the operator's fingers cannot pass under the needle. It shall be of such form that the needle can be conveniently threaded without removing the guard. This requirement will not apply to domestic-type sewing machines having a presser-foot which is in the "down" position during operation of the machine.

(2) Exhaust or ventilating fans. Each exhaust or ventilating fan within seven feet of the floor or working platform shall be completely covered with wire mesh of not less than No. 16 gauge, and with openings that will reject a ball one-half inch in diameter.

(3) Steam pipes.

(a) All steam pipes that are within seven feet of the floor or working platform, and with which the worker may come into contact, shall be insulated or covered with a heat-resistant material or shall be guarded to prevent direct contact with the worker.

(b) Where pressure-reducing valves are used, one or more relief or safety valves shall be provided on the low-pressure side of the reducing valve, in case the piping or equipment on the low-pressure side does not meet the requirements for full initial pressure. The relief or safety valve shall be located adjacent to, or as close as possible to,

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the reducing valve. Relief and safety valves vented to the atmosphere shall be so constructed as to prevent injury or damage caused by fluid escaping from relief or safety valves. The vents shall be of ample size and as short and direct as possible. The combined discharge capacity of the relief valves shall be such that the pressure rating of the lower-pressure piping and equipment will not be exceeded if the reducing valve sticks or fails to open.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-303-02007, filed 5/15/89, effective 6/30/89; Order 74-18, § 296-303-02007, filed 5/6/74.]

WAC 296-303-025 Operating rules—Scope and application. All sections of this chapter which include WAC 296-303-025 in the section number apply to operating rules.

[Order 74-18, § 296-303-025, filed 5/6/74.]

WAC 296-303-02501 General. (1) Floors.

(a) The floors of every room in a laundry that are used for washing purposes shall be properly constructed of cement, tile, or similar material. The floors shall be watertight, free from projections, crevices, or dangerous gradients. They shall be maintained in good repair and so drained that no water may accumulate.

(b) The floors of every room except washrooms shall be constructed of hardwood or any impervious material, free from protruding nails, splinters, or loose boards, and shall be so maintained.

(2) Table tops, shelves, and machine woodwork. Table tops, shelves, and machine woodwork shall be constructed of materials properly surfaced, finished free from splinters, and so maintained.

(3) Markers. Markers and others handling soiled clothes shall be warned against touching the eyes, mouth, or any part of the body on which the skin has been broken by a scratch or abrasion; and they shall be cautioned not to touch or eat food until their hands have been thoroughly washed.

(4) Ventilation. Where artificial ventilation is necessary to the maintenance of comfortable working conditions, an adequate ventilating system shall be installed as specified in WAC 296-62-110 of the general occupational health standards.

(5) Instruction of employees. Employees shall be properly instructed as to the hazards of their work and be instructed in safe practices, by bulletins, printed rules, and verbal instructions.

[Order 74-18, § 296-303-02501, filed 5/6/74.]

WAC 296-303-02503 Mechanical. (1) Safety guards.

(a) No safeguard, safety appliance, or device attached to, or forming an integral part of any machinery shall be removed or made ineffective except for the purpose of making immediate repairs or adjustments. Any such safeguard, safety appliance, or device removed or made ineffective during the repair or adjustment of such machinery shall be replaced immediately upon the completion of such repairs or adjustments.

(b) No machine shall be operated until such repairs and adjustments have been made and the machine is in good working condition.

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(2) Steam-pressure apparatus. Steam machines shall not be operated at a pressure above that given by the manufacturer's pressure rating as shown on name plate. If the steam source is at a pressure higher than that given by the manufacturer's rating, a stop valve, reducing valve, pressure gauge, and safety valve shall be installed, in the order named, from the source. The safety valve shall be located in a nonhazardous place.

(3) Machine adjustments. No moving parts of any machine shall be oiled, cleaned, adjusted, or repaired while said machine is in operation or in motion except that the rolls of adjusting machines not equipped with hand-power means shall be operated at the slowest speed possible with an operator constantly at the starting mechanism.

(4) Extractors. Each extractor shall be dismantled and inspected at least once a year and, if necessary, repaired. Overdriven extractors, if provided with handholes through which basket and rings can be inspected, need not be dismantled.

[Order 74-18, § 296-303-02503, filed 5/6/74.]

WAC 296-303-030 Moving parts. (1) Machine guarding (other than point of operation). Moving parts of machines, such as gears, sprockets, belts, pulleys, and shafts, shall be guarded in accordance with the requirements of WAC 296-24-20507 through 296-24-20513, of the general safety and health standards.

(2) Prime-mover guarding. Moving parts of prime movers such as fly-wheels, cranks and connecting rods, tail rods or extension piston rods, and governor balls, shall be guarded in accordance with the requirements of WAC 296-24-20505, of the general safety and health standards.

[Order 74-18, § 296-303-030, filed 5/6/74.]

WAC 296-303-040 Starting and stopping devices. (1) Each power-driven machine shall be provided with means for disconnecting from the source of power. Starting and stopping devices for machines shall be so located as to be operable from the front of the machine, and so constructed as to allow proper guarding of belts and pulleys.

(2) Doors of washing machines, extractors, and tumbler/shaker dryer machines, shall have a cut-off micro switch or other method to shut-off power when loading doors are opened, making inner cylinder, tumbler, or shaker mechanisms inoperative while the door is open. In those situations where the cylinder or mechanism continues to rotate/move, and present a hazard after the power is off, an interlocking device, breaking switch, or a time-delay switch is additionally required to prevent injury.

[Statutory Authority: Chapter 49.17 RCW. 89-11-035 (Order 89-03), § 296-303-040, filed 5/15/89, effective 6/30/89; Order 74-18, § 296-303-040, filed 5/6/74.]

Chapter 296-304 WAC

SAFETY STANDARDS FOR SHIP REPAIRING, SHIPBUILDING AND SHIPBREAKING

WAC

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 296-304-20001 General provisions.
 296-304-20003 Unit proof test and examination of cranes.
 296-304-20005 Annual examination of cranes.

296-304-20007 Unit proof test and examination of derricks.
 296-304-20009 Annual examination of derricks.
 296-304-20011 Determination of crane or derrick safe working loads and limitations in absence of manufacturer's data.
 296-304-20013 Safe working load reduction.
 296-304-20015 Safe working load increase.
 296-304-20017 Nondestructive examination.
 296-304-20019 Wire rope.
 296-304-20021 Heat treatment.
 296-304-20023 Examination of bulk cargo loading or discharging spouts or suckers.
 296-304-20025 Documentation.

WAC 296-304-010 Scope and application. (1) The provisions and standards of the general safety and health standards, chapters 296-24 and 296-62 WAC, and such other codes and standards as are promulgated by the department of labor and industries which are applicable to all industries, shall be applicable in the ship repairing, shipbuilding, or shipbreaking industries whenever the employees are covered under the Washington State Industrial Safety and Health Act, chapter 49.17 RCW. The rules of this chapter and the rules of the aforementioned chapters 296-24 and 296-62 WAC are applicable to all ship repairing, shipbuilding, and shipbreaking industries and operations, provided that such rules shall not be applicable to those operations under the exclusive safety jurisdiction of the federal government.

(2) The responsibility for compliance with these regulations is placed upon "employers" as defined in WAC 296-304-01001.

(3) It is not the intent of these regulations to place additional responsibilities or duties on owners, operators, agents or masters of vessels unless such persons are acting as employers, nor is it the intent of these regulations to relieve such owners, operators, agents or masters of vessels from responsibilities or duties now placed upon them by law, regulation or custom.

(4) The responsibilities placed upon the competent person herein shall be deemed to be the responsibilities of the employer.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-010, filed 12/26/97, effective 3/1/98. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-304-010, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-010, filed 1/18/95, effective 3/10/95; 89-11-035 (Order 89-03), § 296-304-010, filed 5/15/89, effective 6/30/89; Order 75-6, § 296-304-010, filed 3/10/75; Order 74-25, § 296-304-010, filed 5/7/74.]

WAC 296-304-01001 Definitions. "Anchorage" - A secure point to attach lifelines, lanyards, or deceleration devices.

"Body belt" - A strap with means to both secure it around the waist and to attach it to a lanyard, lifeline, or deceleration device. Body belts may be used only in fall restraint or positioning device systems and may not be used for fall arrest.

"Body harness" - Straps to secure around an employee so that fall arrest forces are distributed over at least the thighs, shoulders, chest and pelvis with means to attach it to other components of a personal fall arrest system.

"Cold-work" - Work that does not involve riveting, welding, burning, or other fire-producing or spark-producing operations.

"Competent person" - A person who can recognize and evaluate employee exposure to hazardous substances or to

other unsafe conditions and can specify the necessary protection and precautions necessary to ensure the safety of employees as required by these standards.

"Confined space" - A small compartment with limited access such as a double bottom tank, cofferdam, or other small, confined space that can readily create or aggravate a hazardous exposure.

"Connector" - A device used to connect parts of a personal fall arrest system or parts of a positioning device system together. It may be:

- An independent component of the system (such as a carabiner); or

- An integral component of part of the system (such as a buckle or D-ring sewn into a body belt or body harness or a snaphook spliced or sewn to a lanyard or self-retracting lanyard).

"Deceleration device" - A mechanism, such as a rope grab, rip stitch lanyard, specially woven lanyard, tearing or deforming lanyard, or automatic self-retracting lifeline/lanyard, that serves to dissipate a substantial amount of energy during a fall arrest, or to limit the energy imposed on an employee during fall arrest.

"Deceleration distance" - The additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured from the location of an employee's body belt or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, to the location of that attachment point after the employee comes to a full stop.

"Director" - The director of the department of labor and industries or a designated representative.

"Employee" - Any person engaged in ship repairing, ship building, or ship breaking or related employment as defined in these standards.

"Employer" - An employer with employees who are employed, in whole or in part, in ship repair, ship building and ship breaking, or related employment as defined in these standards.

"Enclosed space" - A space, other than a confined space, that is enclosed by bulkheads and overhead. It includes cargo holds, tanks, quarters, and machinery and boiler spaces.

"Equivalent" - Alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the method or item specified in the standard.

"Free fall" - To fall before a personal fall arrest system begins to apply force to arrest the fall.

"Free fall distance" - The vertical displacement of the fall arrest attachment point on the employee's body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before the device operates and fall arrest forces occur.

"Gangway" - A ramp-like or stair-like means to board or leave a vessel including accommodation ladders, gang-planks and brows.

"Hazardous substance" - A substance likely to cause injury because it is explosive, flammable, poisonous, corrosive, oxidizing, irritant, or otherwise harmful.

"Hot-work" - Riveting, welding, burning or other fire or spark producing operations.

"Lanyard" - A flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.

"Lifeline" - A component consisting of a flexible line to connect to an anchorage at one end to hang vertically (vertical lifeline), or to connect to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

"Lower levels" - Those areas or surfaces to which an employee can fall. Such areas or surfaces include but are not limited to ground levels, floors, ramps, tanks, materials, water, excavations, pits, vessels, structures, or portions thereof.

"Personal fall arrest system" - A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, body harness and may include a lanyard, a deceleration device, a lifeline, or a suitable combination.

"Portable unfired pressure vessel" - A pressure container or vessel used aboard ship, other than the ship's equipment, containing liquids or gases under pressure. This does not include pressure vessels built to ICC regulations under 49 CFR Part 78, Subparts C and H.

"Positioning device system" - A body belt or body harness system rigged to allow an employee to be supported at an elevated vertical surface, such as a wall or window, and to be able to work with both hands free while leaning.

"Powder actuated fastening tool" - A tool or machine that drives a stud, pin, or fastener by means of an explosive charge.

"Qualified person" - A person who has successfully demonstrated the ability to solve or resolve problems related to the subject matter and work by possessing a recognized degree or certificate of professional standing or by extensive knowledge, training, and experience.

"Related employment" - Any employment related to or performed in conjunction with ship repairing, ship building or ship breaking work, including, but not limited to, inspecting, testing, and serving as a watchman.

"Restraint (tether) line" - A line from an anchorage, or between anchorages, to which the employee is secured so as to prevent the employee from walking or falling off an elevated work surface.

Note: A restraint line is not necessarily designed to withstand forces resulting from a fall.

"Rope grab" - A deceleration device that travels on a lifeline and automatically, by friction, engages the lifeline and locks to arrest the fall of an employee. A rope grab usu-

ally uses the principle of inertial locking, cam/level locking or both.

"**Shall**" or "**must**" - Mandatory.

"**Ship breaking**" - Breaking down a vessel's structure to scrap the vessel, including the removal of gear, equipment or any component part of a vessel.

"**Ship building**" - Construction of a vessel, including the installation of machinery and equipment.

"**Ship repairing**" - Repair of a vessel including, but not limited to, alterations, conversions, installations, cleaning, painting, and maintenance.

"**Vessel**" - Every watercraft for use as a means of transportation on water, including special purpose floating structures not primarily designed for or used as a means of transportation on water.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-01001, filed 12/26/97, effective 3/1/98. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-01001, filed 1/18/95, effective 3/10/95; Order 76-7, § 296-304-01001, filed 3/1/76; Order 74-25, § 296-304-01001, filed 5/7/74.]

WAC 296-304-01003 Reference specifications, standards, and codes. Specifications, standards, and codes of agencies of the U.S. government, to the extent specified in the text, form a part of these regulations. In addition, the specifications, standards, and codes of organizations which are not agencies of the U.S. government, in effect on the date of the promulgation of these regulations as listed below, to the extent specified in the text, form a part of these standards:

National Fire Protection Association, 60 Batterymarch Street, Boston, Mass. 02110,

Underwriters' Laboratories, Inc., 207 East Ohio Street, Chicago, Ill. 60611,

United States of America Standard Safety Code for Portable Wood Ladders, A14.1-1959, United States of America Standards Institute, Inc., 10 East 40th Street, New York, N.Y. 10016,

United States of America Standard Safety Code for Portable Metal Ladders, A14.2-1956, United States of America Standards Institute, Inc., 10 East 40th Street, New York, N.Y. 10016,

United States of America Standard Safety Code for Head, Eye, and Respiratory Protection, Z2.1-1959, United States of America Standards Institute, Inc., 10 East 40th Street, New York, N.Y. 10016,

American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, Section VIII, Rules for Construction of Unfired Pressure Vessels, American Society of Mechanical Engineers, 345 East 47th Street, New York, N.Y. 10017,

Threshold Limit Values, American Conference of Governmental Industrial Hygienists, 1014 Broadway, Cincinnati, Ohio 45202,

United States of America Standards Safety Code for the Use, Care, and Protection of Abrasive Wheels, B7.1-1964, United States of America Standards Institute, Inc., 10 East 40th Street, New York, N.Y. 10016.

[Order 74-25, § 296-304-01003, filed 5/7/74.]

WAC 296-304-01005 Competent person. (1) Application. This section applies to shipyard employment.

(2) Designation.

(a) One or more competent persons shall be designated by the employer in accordance with the applicable requirements of this section, unless the requirements of WAC 296-304-020 through 296-304-02011, WAC 296-304-030 through 296-304-03009, WAC 296-304-040 through 296-304-04013, and WAC 296-304-080 through 296-304-08011, are always carried out by a marine chemist.

Exception: The employer may designate any person who meets the applicable portions of the criteria set forth in subsection (3) of this section as a competent person who is limited to performing testing to the following situations:

(i) Repair work on small craft in boat yards where only combustible gas indicator tests are required for fuel tank leaks or when using flammable paints below decks;

(ii) Building of wooden vessels where only knowledge of the precautions to be taken when using flammable paints is required;

(iii) The breaking of vessels where there is no fuel oil or other flammable hazard; and

(iv) Tests and inspections performed to comply with WAC 296-304-03007 (2)(h) and 296-304-03009 (1)(e).

(b) The employer shall maintain either a roster of designated competent persons or a statement that a marine chemist will perform the tests or inspections which require a competent person.

(c) The employer shall make the roster of designated persons or the statement available to employees, the employee's representative, or the director upon request.

(d) The roster shall contain, as a minimum, the following:

(i) The employer's name;

(ii) The designated competent person's name(s); and

(iii) The date the employee was trained as a competent person.

(3) Criteria. The employer shall ensure that each designated competent person has the following skills and knowledge:

(a) Ability to understand and carry out written or oral information or instructions left by marine chemist, Coast Guard authorized persons and certified industrial hygienists;

(b) Knowledge of WAC 296-304-020 through 296-304-02011, WAC 296-304-030 through 296-304-03009, WAC 296-304-040 through 296-304-04013, and WAC 296-304-080 through 296-304-08011;

(c) Knowledge of the structure, location, and designation of spaces where work is done;

(d) Ability to calibrate and use testing equipment including but not limited to, oxygen indicators, combustible gas indicators, carbon monoxide indicators, and carbon dioxide indicators, and to interpret accurately the test results of that equipment;

(e) Ability to perform all required tests and inspections which are or may be performed by a competent person as set forth in WAC 296-304-020 through 296-304-02011, WAC 296-304-030 through 296-304-03009, WAC 296-304-040

through 296-304-04013, and WAC 296-304-080 through 296-304-08011;

(f) Ability to inspect, test, and evaluate spaces to determine the need for further testing by a marine chemist or a certified industrial hygienist; and

(g) Ability to maintain records required by this section.

(4) Recordkeeping.

(a) When tests and inspections are performed by a competent person, marine chemist, or certified industrial hygienist as required by any provisions of WAC 296-304-020 through 296-304-02011, WAC 296-304-030 through 296-304-03009, WAC 296-304-040 through 296-304-04013, or WAC 296-304-080 through 296-304-08011, the employer shall ensure that the person performing the test and inspection records the location, time, date, location of inspected spaces, and the operations performed, as well as the test results and any instructions.

(b) The employer shall ensure that the records are posted in the immediate vicinity of the affected operations while work in the spaces is in progress. The records shall be kept on file for a period of at least three months from the completion date of the specific job for which they were generated.

(c) The employer shall ensure that the records are available for inspection by the director, and employees and their representatives.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-01005, filed 1/18/95, effective 3/10/95.]

WAC 296-304-020 Confined and enclosed spaces and other dangerous atmospheres in shipyard employment.

Scope, application and definitions applicable to this subsection: (1) Scope and application. This section applies to work in confined and enclosed spaces and other dangerous atmospheres in shipyard employment, including vessels, vessel sections, and on land-side operations regardless of geographic location.

(2) Definitions applicable to this section:

Adjacent spaces means those spaces bordering a subject space in all directions, including all points of contact, corners, diagonals, decks, tank tops, and bulkheads.

Certified industrial hygienist (CIH) means an industrial hygienist who is certified by the American Board of Industrial Hygiene.

Coast Guard authorized person means an individual who meets the requirement of WAC 296-304-02015, Appendix B, for tank vessels, for passenger vessels, and for cargo and miscellaneous vessels.

Dangerous atmosphere means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (i.e., escape unaided from a confined or enclosed space), injury, or acute illness.

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

Enter with restrictions denotes a space where entry for work is permitted only if engineering controls, personal protective equipment, clothing, and time limitations are as specified by the marine chemist, certified industrial hygienist, or the shipyard competent person.

Entry means the action by which a person passes through an opening into a space. Entry includes ensuing work

activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Hot work means any activity involving riveting, welding, burning, the use of powder-actuated tools or similar fire-producing operations. Grinding, drilling, abrasive blasting, or similar spark-producing operations are also considered hot work except when such operations are isolated physically from any atmosphere containing more than 10 percent of the lower explosive limit of a flammable or combustible substance.

Immediately dangerous to life or health (IDLH) means an atmosphere that poses an immediate threat to life or that is likely to result in acute or immediate severe health effects.

Inert or inerted atmosphere means an atmospheric condition where:

(a) The oxygen content of the atmosphere in the space is maintained at a level equal to or less than 8.0 percent by volume or at a level at or below 50 percent of the amount required to support combustion, whichever is less; or

(b) The space is flooded with water and the vapor concentration of flammable or combustible materials in the free space atmosphere above the water line is less than 10 percent of the lower explosive limit for the flammable or combustible material.

Labeled means identified with a sign, placard, or other form of written communication, including pictograms, that provides information on the status or condition of the work space to which it is attached.

Lower explosive limit (LEL) means the minimum concentration of vapor in air below which propagation of a flame does not occur in the presence of an ignition source.

Marine chemist means an individual who possesses a current marine chemist certificate issued by the National Fire Protection Association (NFPA).

NFPA means National Fire Protection Association.

Nationally Recognized Testing Laboratory (NRTL) means an organization recognized by OSHA, in accordance with Appendix A of 29 CFR 1910.7, which tests for safety and lists or labels or accepts equipment and materials that meet all the criteria found in Section 1910.7(b)(1) through (b)(4)(ii).

Not safe for hot work denotes a space where hot work may not be performed because the conditions do not meet the criteria for "safe for hot work."

Not safe for workers denotes a space where an employee may not enter because the conditions do not meet the criteria for "safe for workers."

Oxygen-deficient atmosphere means an atmosphere having an oxygen concentration of less than 19.5 percent by volume.

Oxygen-enriched atmosphere means an atmosphere that contains 22.0 percent or more oxygen by volume.

Safe for hot work denotes a space that meets all of the following criteria:

(a) The oxygen content of the atmosphere does not exceed 22.0 percent by volume;

(b) The concentration of flammable vapors in the atmosphere is less than 10 percent of the lower explosive limit;

(c) The residues or materials in the space are not capable of producing a higher concentration than permitted in (a) or (b) of the above, under existing atmospheric conditions in the presence of hot work and while maintained as directed by the marine chemist or competent person; and

(d) All adjacent spaces have been cleaned, or inerted, or treated sufficiently to prevent the spread of fire.

Safe for workers denotes a space that meets the following criteria:

(a) The oxygen content of the atmosphere is at least 19.5 percent and below 22.0 percent by volume;

(b) The concentration of flammable vapors is below 10 percent of the lower explosive limit (LEL);

(c) Any toxic materials in the atmosphere associated with cargo, fuel, tank coatings, or inerting media are within permissible concentrations at the time of the inspection; and

(d) Any residues or materials associated with the work authorized by the marine chemist, certified industrial hygienist, or competent person will not produce uncontrolled release of toxic materials under existing atmospheric conditions while maintained as directed.

Space means an area on a vessel or vessel section or within a shipyard such as, but not limited to: Cargo tanks or holds; pump or engine rooms; storage lockers; tanks containing flammable or combustible liquids, gases, or solids; rooms within buildings; crawl spaces; tunnels; or accessways. The atmosphere within a space is the entire area within its bounds.

Upper explosive limit (UEL) means the maximum concentration of flammable vapor in air above which propagation of flame does not occur on contact with a source of ignition.

Vessel section means a subassembly, module, or other component of a vessel being built, repaired, or broken.

Visual inspection means the physical survey of the space, its surroundings and contents to identify hazards such as, but not limited to, restricted accessibility, residues, unguarded machinery, and piping or electrical systems.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-020, filed 1/18/95, effective 3/10/95; 93-04-111 (Order 92-15), § 296-304-020, filed 2/3/93, effective 3/15/93; Order 74-25, § 296-304-020, filed 5/7/74.]

WAC 296-304-02001 Reserved.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02001, filed 1/18/95, effective 3/10/95; Order 76-7, § 296-304-02001, filed 3/1/76; Order 74-25, § 296-304-02001, filed 5/7/74.]

WAC 296-304-02003 Precautions and the order of testing before entering confined and enclosed spaces and other dangerous atmospheres. The employer shall ensure that atmospheric testing is performed in the following sequence: Oxygen content, flammability, toxicity.

(1) Oxygen content.

(a) The employer shall ensure that the following spaces are visually inspected and tested by a competent person to determine the atmosphere's oxygen content prior to initial entry into the space by an employee:

(i) Spaces that have been sealed, such as, but not limited to, spaces that have been coated and closed up, and nonventilated spaces that have been freshly painted;

(ii) Spaces and adjacent spaces that contain or have contained combustible or flammable liquids or gases;

(iii) Spaces and adjacent spaces that contain or have contained liquids, gases, or solids that are toxic, corrosive, or irritant;

(iv) Spaces and adjacent spaces that have been fumigated; and

(v) Spaces containing materials or residues of materials that create an oxygen-deficient atmosphere.

(b) If the space to be entered contains an oxygen deficient atmosphere, the space shall be labeled "not safe for workers" or, if oxygen-enriched, "not safe for workers—not safe for hot work." If an oxygen-deficient or oxygen-enriched atmosphere is found, ventilation shall be provided at volumes and flow rates sufficient to ensure that the oxygen content is maintained at or above 19.5 percent and below 22.0 percent by volume. The warning label may be removed when the oxygen content is equal to or greater than 19.5 and less than 22.0 percent by volume.

(c) An employee may not enter a space where the oxygen content, by volume, is below 19.5 percent or above 22.0 percent.

Exception: An employee may enter for emergency rescue or for a short duration for installation of ventilation equipment necessary to start work in the space provided:

(i) The atmosphere in the space is monitored for oxygen content, by volume, continuously; and

(ii) Respiratory protection and other appropriate personal protective equipment and clothing are provided in accordance with WAC 296-304-090 through 296-304-09007.

Note to (a): Other provisions for work in IDLH atmospheres are located in WAC 296-304-090 through 296-304-09007.

(2) Flammable atmospheres.

(a) The employer shall ensure that spaces and adjacent spaces that contain or have contained combustible or flammable liquids or gases are:

(i) Inspected visually by the competent person to determine the presence of combustible or flammable liquids; and

(ii) Tested by a competent person prior to entry by an employee to determine the concentration of flammable vapors and gases within the space.

(b) If the concentration of flammable vapors or gases in the space to be entered is equal to or greater than 10 percent of the lower explosive limit, the space shall be labeled "not safe for workers" and "not safe for hot work." Ventilation shall be provided at volumes and flow rates sufficient to ensure that the concentration of flammable vapors is maintained below 10 percent of the lower explosive limit. The warning labels may be removed when the concentration of flammable vapors is below 10 percent of the lower explosive limit.

(c) An employee may not enter a space where the concentration of flammable vapors or gases is equal to or greater than 10 percent of the lower explosive limit.

Exception: An employee may enter for emergency rescue or for a short duration for installation of ventilation equipment necessary to start work in the space, provided:

(i) No ignition sources are present;

(ii) The atmosphere in the space is monitored continuously;

(iii) Atmospheres at or above the upper explosive limit are maintained; and

(iv) Respiratory protection and other appropriate personal protective equipment and clothing are provided in accordance with WAC 296-304-090 through 296-304-09007.

Note 1 to (2): Additional provisions for work in IDLH atmospheres are located in WAC 296-304-090 through 296-304-09007.

Note 2 to (2): Additional provisions for work in spaces containing a flammable substance which also has a permissible exposure limit, are located in subsection (3) of this section and chapter 296-62 WAC, Part H.

(3) Toxic, corrosive, irritant or fumigated atmospheres and residues.

(a) The employer shall ensure that spaces or adjacent spaces that contain or have contained liquids, gases, or solids that are toxic, corrosive or irritant are:

(i) Inspected visually by the competent person to determine the presence of toxic, corrosive, or irritant residue contaminants; and

(ii) Tested by a competent person prior to initial entry by an employee to determine the air concentration of toxics, corrosives, or irritants within the space.

(b) If a space contains an air concentration of a material which exceeds a chapter 296-62 WAC, Part H, permissible exposure limit (PEL) or is IDLH, the space shall be labeled "not safe for workers." Ventilation shall be provided at volumes and flow rates which will ensure that air concentrations are maintained within the PEL or, in the case of contaminants for which there is no established PEL, below the IDLH. The warning label may be removed when the concentration of contaminants is maintained within the PEL or below IDLH level.

(c) If a space cannot be ventilated to within the PELs or is IDLH, a marine chemist or CIH must re-test until the space can be certified "enter with restrictions" or "safe for workers."

(d) An employee may not enter a space whose atmosphere exceeds a PEL or is IDLH.

Exception: An employee may enter for emergency rescue, or for a short duration for installation of ventilation equipment provided:

(i) The atmosphere in the space is monitored continuously;

(ii) Respiratory protection and other necessary and appropriate personal protective equipment and clothing are provided in accordance with WAC 296-304-090 through 296-304-09007.

Note to (3): Other provisions for work in IDLH atmospheres are located in WAC 296-304-090 through 296-304-9007.

(4) Training of employees entering confined and enclosed spaces or other dangerous atmospheres.

(a) The employer shall ensure that each employee that enters a confined or enclosed space and other areas with dangerous atmospheres is trained to perform all required duties safely.

(b) The employer shall ensure that each employee who enters a confined space, enclosed space, or other areas with dangerous atmospheres is trained to:

(i) Recognize the characteristics of the confined space;

(ii) Anticipate and be aware of the hazards that may be faced during entry;

(iii) Recognize the adverse health effects that may be caused by the exposure to a hazard;

(iv) Understand the physical signs and reactions related to exposures to such hazards;

(v) Know what personal protective equipment is needed for safe entry into and exit from the space;

(vi) Use personal protective equipment; and

(vii) Where necessary, be aware of the presence and proper use of barriers that may be needed to protect an entrant from hazards.

(c) The employer shall ensure that each entrant into confined or enclosed spaces or other dangerous atmospheres is trained to exit the space or dangerous atmosphere whenever:

(i) The employer or his or her representative orders evacuation;

(ii) An evacuation signal such as an alarm is activated; or

(iii) The entrant perceives that he or she is in danger.

(d) The employer shall provide each employee with training:

(i) Before the entrant begins work addressed by this chapter; and

(ii) Whenever there is a change in operations or in an employee's duties that presents a hazard about which the employee has not previously been trained.

(e) The employer shall certify that the training required by (a) through (d) of this subsection has been accomplished.

(i) The certification shall contain the employee's name, the name of the certifier, and the date(s) of the certification.

(ii) The certification shall be available for inspection by the director, employees, and their representatives.

(5) Rescue teams. The employer shall either establish a shipyard rescue team or arrange for an outside rescue team which will respond promptly to a request for rescue service.

(a) Shipyard rescue teams shall meet the following criteria:

(i) Each employee assigned to the shipyard team shall be provided with and trained to use the personal protective equipment he or she will need, including respirators and any rescue equipment necessary for making rescues from confined and enclosed spaces and other dangerous atmospheres.

(ii) Each employee assigned to the shipyard rescue team shall be trained to perform his or her rescue functions including confined and enclosed and other dangerous atmosphere entry.

(iii) Shipyard rescue teams shall practice their skills at least once every 12 months. Practice drills shall include the use of mannequins and rescue equipment during simulated rescue operations involving physical facilities that approximate closely those facilities from which rescue may be needed.

Note to (5)(a)(iii): If the team performs an actual rescue during the 12 month period, an additional practice drill for that type of rescue is not required.

(iv) At least one person on each rescue team shall maintain current certification in basic first aid which includes maintenance of an airway, control of bleeding, maintenance of circulation and cardiopulmonary resuscitation (CPR) skills.

(b) The employer shall inform outside rescue teams of the hazards that the team may encounter when called to perform confined and enclosed space or other dangerous atmosphere rescue at the employer's facility so that the rescue team can be trained and equipped.

Note to (5): The criteria for in-house rescue, listed in (5)(a) can be used by the employer in evaluating outside rescue services.

(6) Exchanging hazard information between employers. Each employer whose employees work in confined and enclosed spaces or other dangerous atmospheres shall ensure that all available information on the hazards, safety rules, and emergency procedures concerning those spaces and atmospheres is exchanged with any other employer whose employees may enter the same spaces.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-304-02003, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02003, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-02003, filed 9/22/93, effective 11/1/93; Order 76-7, § 296-304-02003, filed 3/1/76; Order 74-25, § 296-304-02003, filed 5/7/74.]

WAC 296-304-02005 Cleaning and other cold work.

(1) Locations covered by this section. The employer shall ensure that manual cleaning and other cold work are not performed in the following spaces unless the conditions of subsection (2) of this section have been met:

(a) Spaces containing or having last contained bulk quantities of combustible or flammable liquids or gases; and

(b) Spaces containing or having last contained bulk quantities of liquids, gases or solids that are toxic, corrosive or irritating.

(2) Requirements for performing cleaning or cold work.

(a) Liquid residues of hazardous materials shall be removed from work spaces as thoroughly as practicable before employees start cleaning operations or cold work in a space. Special care shall be taken to prevent the spilling or the draining of these materials into the water surrounding the vessel, or for shore-side operations, onto the surrounding work area.

(b) Testing shall be conducted by a competent person to determine the concentration of flammable, combustible, toxic, corrosive, or irritant vapors within the space prior to the beginning of cleaning or cold work.

(c) Continuous ventilation shall be provided at volumes and flow rates sufficient to ensure that the concentration(s) of:

(i) Flammable vapor is maintained below 10 percent of the lower explosive limit; and

Note to (2)(c)(i): Spaces containing highly volatile residues may require additional ventilation to keep the concentration of flammable vapors below 10 percent of the lower explosive limit and within the permissible exposure limit.

(ii) Toxic, corrosive, or irritant vapors are maintained within the permissible exposure limits and below IDLH levels.

(d) Testing shall be conducted by the competent person as often as necessary during cleaning or cold work to assure that air concentrations are below 10 percent of the lower explosive limit and within the PELs and below IDLH levels.

[Title 296 WAC—p. 2406]

Factors such as, but not limited to, temperature, volatility of the residues and other existing conditions in and about the spaces are to be considered in determining the frequency of testing necessary to assure a safe atmosphere.

Note to (2)(d): See WAC 296-304-02013—Appendix A, for additional information on frequency of testing.

(e) Spills or other releases of flammable, combustible, toxic, corrosive, and irritant materials shall be cleaned up as work progresses.

(f) An employee may not enter a confined or enclosed space or other dangerous atmosphere if the concentration of flammable or combustible vapors in work spaces exceeds 10 percent of the lower explosive limit.

Exception: An employee may enter for emergency rescue or for a short duration for installation of ventilation equipment provided:

(i) No ignition sources are present;

(ii) The atmosphere in the space is monitored continuously;

(iii) The atmosphere in the space is maintained above the upper explosive limit; and

(iv) Respiratory protection, personal protective equipment, and clothing are provided in accordance with WAC 206-304-090 through 296-304-09007.

Note to (2)(f): Other provisions for work in IDLH and other dangerous atmospheres are located in WAC 296-304-090 through 296-304-09007.

(g) A competent person shall test ventilation discharge areas and other areas where discharged vapors may collect to determine if vapors discharged from the spaces being ventilated are accumulating in concentrations hazardous to employees.

(h) If the tests required in (g) of this subsection indicate that concentrations of exhaust vapors that are hazardous to employees are accumulating, all work in the contaminated area shall be stopped until the vapors have dissipated or been removed.

(i) Only explosion-proof, self-contained portable lamps, or other electric equipment approved by a National Recognized Testing Laboratory (NRTL) for the hazardous location shall be used in spaces described in subsection (1) of this section, until such spaces have been certified as "safe for workers."

Note to (2)(i): Battery-fed, portable lamps or other electric equipment bearing the approval of a NRTL for the class, and division of the location in which they are used are deemed to meet the requirements of (i) of this subsection.

(j) The employer shall prominently post signs that prohibit sources of ignition within or near a space that has contained flammable or combustible liquids or gases in bulk quantities:

(i) At the entrance to those spaces;

(ii) In adjacent spaces; and

(iii) In the open area adjacent to those spaces.

(k) All air moving equipment and its component parts, including duct work, capable of generating a static electric discharge of sufficient energy to create a source of ignition, shall be bonded electrically to the structure of a vessel or ves-

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sel section or, in the case of land-side spaces, grounded to prevent an electric discharge in the space.

(1) Fans shall have nonsparking blades, and portable air ducts shall be of nonsparking materials.

Note to (2): See WAC 296-304-02003(3) and applicable requirements of chapter 296-62 WAC, general occupational health standards, for other provisions affecting cleaning and cold work.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02005, filed 1/18/95, effective 3/10/95; Order 74-25, § 296-304-02005, filed 5/7/74.]

WAC 296-304-02007 Hot work. (1) Hot work requiring testing by a marine chemist or Coast Guard authorized person.

(a) The employer shall ensure that hot work is not performed in or on any of the following confined and enclosed spaces and other dangerous atmospheres, boundaries of spaces or pipelines until the work area has been tested and certified by a marine chemist or a U.S. Coast Guard authorized person as "safe for hot work":

(i) Within, on, or immediately adjacent to spaces that contain or have contained combustible or flammable liquids or gases.

(ii) Within, on, or immediately adjacent to fuel tanks that contain or have last contained fuel; and

(iii) On pipelines, heating coils, pump fittings or other accessories connected to spaces that contain or have last contained fuel.

(iv) Exception: On dry cargo, miscellaneous and passenger vessels and in the landside operations within spaces which meet the standards for oxygen, flammability and toxicity in WAC 296-304-02003, but are adjacent to spaces containing flammable gases or liquids, as long as the gases or liquids have a flash point below 150 deg. F (65.6 deg. C) and the distance between such spaces and the work is 25 feet (7.5 m) or greater.

Note: For flammable liquids with flash points above 150 deg. F (65.6 deg. C), see subsection (2) of this section.

Note to (1)(a): The criteria for "safe for hot work" is located in the definition section, WAC 296-304-020(2).

(b) The certificate issued by the marine chemist or Coast Guard authorized person shall be posted in the immediate vicinity of the affected operations while they are in progress and kept on file for a period of at least three months from the date of the completion of the operation for which the certificate was generated.

(2) Hot work requiring testing by a competent person.

(a) Hot work is not permitted in or on the following spaces or adjacent spaces or other dangerous atmospheres until they have been tested by a competent person and determined to contain no concentrations of flammable vapors equal to or greater than 10 percent of the lower explosive limit:

(i) Dry cargo holds;

(ii) The bilges;

(iii) The engine room and boiler spaces for which a marine chemist or a Coast Guard authorized person certificate is not required under subsection (1)(a)(i) of this section; and

(iv) Vessels and vessel sections for which a marine chemist or Coast Guard authorized person certificate is not required under subsection (1)(a)(i) of this section; and

(v) Land-side confined and enclosed spaces or other dangerous atmospheres not covered by subsection (1)(a) of this section.

(b) If the concentration of flammable vapors or gases is equal to or greater than 10 percent of the lower explosive limit in the space or an adjacent space where the hot work is to be done, then the space shall be labeled "not safe for hot work" and ventilation shall be provided at volumes and flow rates sufficient to ensure that the concentration of flammable vapors or gases is below 10 percent by volume of the lower explosive limit. The warning label may be removed when the concentration of flammable vapors and gases are below 10 percent of the lower explosive limit.

Note to WAC

296-304-02007: See WAC 296-304-02013—Appendix A, for additional information relevant to performing hot work safely.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-304-02007, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02007, filed 1/18/95, effective 3/10/95; Order 76-7, § 296-304-02007, filed 3/1/76; Order 74-25, § 296-304-02007, filed 5/7/74.]

WAC 296-304-02009 Maintenance of safe conditions.

(1) Preventing hazardous materials from entering. Pipelines that could carry hazardous materials into spaces that have been certified "safe for workers" or "safe for hot work" shall be disconnected, blanked off, or otherwise blocked by a positive method to prevent hazardous materials from being discharged into the space.

(2) Alteration of existing conditions. When a change that could alter conditions within a tested confined or enclosed space or other dangerous atmosphere occurs, work in the affected space or area shall be stopped. Work may not be resumed until the affected space or area is visually inspected and retested and found to comply with WAC 296-304-02003, 296-304-02005, and 296-304-02007, as applicable.

Note to (2): Examples of changes that would warrant the stoppage of work include: The opening of manholes or other closures or the adjusting of a valve regulating the flow of hazardous materials.

(3) Tests to maintain the conditions of a marine chemist's or Coast Guard authorized person's certificates. A competent person shall visually inspect and test each space certified as "safe for workers" or "safe for hot work," as often as necessary to ensure that atmospheric conditions within that space is maintained within the conditions established by the certificate after the certificate has been issued.

(4) Change in the conditions of a marine chemist's or Coast Guard authorized person's certificate. If a competent person finds that the atmospheric conditions within a certified space fail to meet the applicable requirements of WAC 296-304-02003, 296-304-02005, and 296-304-02007, work in the certified space shall be stopped and may not be resumed until the space has been retested by a marine chemist or Coast Guard authorized person and a new certificate issued in accordance with WAC 296-304-02007(1).

(5) Tests to maintain a competent person's findings. After a competent person has conducted a visual inspection and tests required in WAC 296-304-02003, 296-304-02005, and 296-304-02007 and determined a space to be safe for an employee to enter, he or she shall continue to test and visually inspect spaces as often as necessary to ensure that the required atmospheric conditions within the tested space are maintained.

(6) Changes in conditions determined by competent person's findings. After the competent person has determined initially that a space is safe for an employee to enter and he or she finds subsequently that the conditions within the tested space fail to meet the requirements of WAC 296-304-02003, 296-304-02005, and 296-304-02007, as applicable, work shall be stopped until the conditions in the tested space are corrected to comply with WAC 296-304-02003, 296-304-02005, and 296-304-02007, as applicable.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 95-22-015, § 296-304-02009, filed 10/20/95, effective 1/16/96. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02009, filed 1/18/95, effective 3/10/95; Order 76-7, § 296-304-02009, filed 3/1/76; Order 74-25, § 296-304-02009, filed 5/7/74.]

WAC 296-304-02011 Warning signs and labels. (1) Employee comprehension of signs and labels. The employer shall ensure that each sign or label posted to comply with the requirements of this section is presented in a manner that can be perceived and understood by all employees.

(2) Posting of large work areas. A warning sign or label required by subsection (1) of this section need not be posted at an individual tank, compartment or work space within a work area if the entire work area has been tested and certified: "Not safe for workers," "not safe for hot work," and if the sign or label to this effect is posted conspicuously at each means of access to the work area.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02011, filed 1/18/95, effective 3/10/95; Order 74-25, § 296-304-02011, filed 5/7/74.]

WAC 296-304-02013 Appendix A—Compliance assistance guidelines for confined and enclosed spaces and other dangerous atmospheres. This appendix is a non-mandatory set of guidelines provided to assist employers in complying with the requirements of WAC 296-304-020 through 296-304-02011. This appendix neither creates additional obligations nor detracts from obligations otherwise contained in this chapter. It is intended to provide explanatory information and educational material to employers and employees to foster understanding of, and compliance with, this chapter.

WAC 296-304-020 through 296-304-02011. These standards are minimum safety standards for entering and working safely in vessel tanks and compartments.

WAC 296-304-020(2) Definition of "Hot work." There are several instances in which circumstances do not necessitate that grinding, drilling, abrasive blasting be regarded as hot work. Some examples are:

(1) Abrasive blasting of the hull for paint preparation does not necessitate pumping and cleaning the tanks of a vessel.

(2) Prior to hot work on any hollow structure, the void space should be tested and appropriate precautions taken.

WAC 296-304-020(2) Definition of "Lower explosive limit." The terms lower flammable limit (LFL) and lower explosive limit (LEL) are used interchangeably in fire science literature.

WAC 296-304-020(2) Definition of "Upper explosive limit." The terms upper flammable limit (UFL) and upper explosive limit (UEL) are used interchangeably in fire science literature.

WAC 296-304-02003(1) After a tank has been properly washed and ventilated, the tank should contain 20.8 percent oxygen by volume. This is the same amount found in our normal atmosphere at sea level. However, it is possible that the oxygen content will be lower. When this is the case, the reasons for this deficiency should be determined and corrective action taken.

An oxygen content of 19.5 percent can support life and is adequate for entry. However, any oxygen level less than 20.8 percent and greater than 19.5 percent level should also alert the competent person to look for the causes of the oxygen deficiency and to correct them prior to entry.

WAC 296-304-02003(2) Flammable atmospheres. Atmospheres with a concentration of flammable vapors at or above 10 percent of the lower explosive limit (LEL) are considered hazardous when located in confined spaces. However, atmospheres with flammable vapors below 10 percent of the LEL are not necessarily safe.

Such atmospheres are too lean to burn. Nevertheless, when a space contains or produces measurable flammable vapors below the 10 percent LEL, it might indicate that flammable vapors are being released or introduced into the space and could present a hazard in time. Therefore, the cause of the vapors should be investigated and, if possible, eliminated prior to entry.

Some situations that have produced measurable concentrations of flammable vapors that could exceed 10 percent of the LEL in time are:

(1) Pipelines that should have been blanked or disconnected have opened, allowing product into the space.

(2) The vessel may have shifted, allowing product not previously cleaned and removed during washing to move into other areas of the vessel.

(3) Residues may be producing the atmosphere by releasing flammable vapor.

WAC 296-304-02003(2) Flammable atmospheres that are toxic. An atmosphere with a measurable concentration of a flammable substance below 10 percent of the LEL may be above the WISHA permissible exposure limit for that substance. In that case, refer to WAC 296-304-02003 (3)(b), (c), and (d).

WAC 296-304-02005 (2)(d), 296-304-02009(3), and 296-304-02009(5). The frequency with which a tank is monitored to determine if atmospheric conditions are being maintained is a function of several factors that are discussed below:

(1) Temperature. Higher temperatures will cause a combustible or flammable liquid to vaporize at a faster rate than lower temperatures. This is important since hotter days may cause tank residues to produce more vapors and that may

result in the vapors exceeding 10 percent of the LEL or an overexposure to toxic contaminants.

(2) Work in the tank. Any activity in the tank could change the atmospheric conditions in that tank. Oxygen from a leaking oxyfuel hose or torch could result in an oxygen-enriched atmosphere that would more easily propagate a flame. Some welding operations use inert gas, and leaks can result in an oxygen-deficient atmosphere. Manual tank cleaning with high pressure spray devices can stir up residues and result in exposures to toxic contaminants. Simple cleaning or mucking out, where employees walk through and shovel residues and sludge, can create a change in atmospheric conditions.

(3) Period of time elapsed. If a period of time has elapsed since a marine chemist or Coast Guard authorized person has certified a tank as safe, the atmospheric condition should be rechecked by the competent person prior to entry and starting work.

(4) Unattended tanks or spaces. When a tank or space has been tested and declared safe, then subsequently left unattended for a period of time, it should be retested prior to entry and starting work. For example, when barges are left unattended at night, unidentified products from another barge are sometimes dumped into their empty tanks. Since this would result in a changed atmosphere, the tanks should be retested prior to entry and starting work.

(5) Work break. When workers take a break or leave at the end of the shift, equipment sometimes is inadvertently left in the tanks. At lunch or work breaks and at the end of the shift are the times when it is most likely someone will leave a burning or cutting torch in the tank, perhaps turned on and leaking oxygen or an inert gas. Since the former can produce an oxygen-enriched atmosphere, and the latter an oxygen-deficient atmosphere, tanks should be checked for equipment left behind, and atmosphere, monitored if necessary prior to re-entering and resuming work. In an oxygen-enriched atmosphere, the flammable range is severely broadened. This means that an oxygen-enriched atmosphere can promote very rapid burning.

(6) Ballasting or trimming. Changing the position of the ballast, or trimming or in any way moving the vessel so as to expose cargo that had been previously trapped, can produce a change in the atmosphere of the tank. The atmosphere should be retested after any such move and prior to entry or work.

WAC 296-304-02007 (1) and (2) hot work. This is a reminder that other sections of the WISHA shipyard safety and health standards in chapter 296-304 WAC should be reviewed prior to starting any hot work. Most notably, WAC 296-304-040 through 296-304-04013, welding, cutting and heating, places additional restrictions on hot work: The requirements of WAC 296-304-04001 and 296-304-04005 must be met before hot work is begun on any metal that is toxic or is covered by a preservative coating respectively; the requirements of WAC 296-304-04007 must be met before welding, cutting, or heating is begun on any structural voids.

WAC 296-304-02003 (1)(b). During hot work, more than 20.8 percent oxygen by volume can be unsafe since it extends the normal flammable range. The standard permits the oxygen level to reach 22.0 percent by volume in order to

account for instrument error. However, the cause of excess oxygen should be investigated and the source removed.

WAC 296-304-02011(2). If the entire vessel has been found to be in the same condition, then employers shall be considered to be in compliance with this requirement when signs using appropriate warning language in accordance with WAC 296-304-02011(1) are posted at the gangway and at all other means of access to the vessel.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02013, filed 1/18/95, effective 3/10/95.]

WAC 296-304-02015 Appendix B—Confined and enclosed spaces and other dangerous atmospheres in shipyard employment. This appendix provides a complete reprint of U.S. Coast Guard regulations as of October 1, 1993 referenced in WAC 296-304-020 for purposes of determining who is a Coast Guard authorized person.

(1) Title 46 CFR 35.01-1 (a) through (c) covering hot work on tank vessels reads as follows:

(a) The provisions of "Standard for the Control of Gas Hazards on Vessels to be Repaired," NFPA No. 306, published by National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269, shall be used as a guide in conducting the inspections and issuance of certificates required by this chapter.

(b) Until an inspection has been made to determine that such operation can be undertaken with safety, no alterations, repairs, or other such operations involving riveting, welding, burning, or like fire-producing actions shall be made:

(i) Within or on the boundaries of cargo tanks that have been used to carry flammable or combustible liquid or chemicals in bulk, or within spaces adjacent to such cargo tanks; or

(ii) Within or on the boundaries of fuel tanks; or

(iii) To pipe lines, heating coils, pumps, fittings, or other appurtenances connected to such cargo or fuel tanks.

(c) Such inspections shall be made and evidenced as follows:

(i) In ports or places in the United States or its territories and possessions, the inspection shall be made by a marine chemist certificated by the National Fire Protection Association; however, if the services of such certified marine chemists are not reasonably available, the Officer in Charge, Marine Inspection, upon the recommendation of the vessel owner and his/her contractor or their representative, shall select a person who, in the case of an individual vessel, shall be authorized to make such inspection.

(ii) If the inspection indicates that such operations can be undertaken with safety, a certificate setting forth the fact in writing and qualified as may be required, shall be issued by the certified marine chemist or the authorized person before the work is started.

(iii) Such qualifications shall include any requirements as may be deemed necessary to maintain, insofar as can reasonably be done, the safe conditions in the spaces certified, throughout the operation and shall include such additional tests and certifications as considered required.

(iv) Such qualifications and requirements shall include precautions necessary to eliminate or minimize hazards that may be present from protective coatings or residues from cargoes.

(2) Title 46 CFR 71.60(c)(1) covering hot work on passenger vessels reads as follows:

(a) The provisions of "Standard for the Control of Gas Hazards on Vessels to be Repaired," NFPA No. 306, published by National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269, shall be used as a guide in conducting the inspections and issuance of certificates required by this chapter.

(b) Until an inspection has been made to determine that such operation can be undertaken with safety, no alterations, repairs, or other such operations involving riveting, welding, burning, or like fire-producing actions shall be made:

(i) Within or on the boundaries of cargo tanks which have been used to carry flammable or combustible liquid or chemicals in bulk, or within spaces adjacent to such cargo tanks; or

(ii) Within or on the boundaries of fuel tanks; or

(iii) To pipe lines, heating coils, pumps, fittings, or other appurtenances connected to such cargo or fuel tanks.

(c) Such inspections shall be made and evidenced as follows:

(i) In ports or places in the United States or its territories and possessions the inspection shall be made by a marine chemist certificated by the National Fire Protection Association; however, if the services of such certified marine chemist are not reasonably available, the Officer in Charge, Marine Inspection, upon the recommendation of the vessel owner and his/her contractor or their representative, shall select a person who, in the case of an individual vessel, shall be authorized to make such inspection.

(ii) If the inspection indicated that such operations can be undertaken with safety, a certificate setting forth the fact in writing and qualified as may be required, shall be issued by the certified marine chemist or the authorized person before the work is started.

(iii) Such qualifications shall include any requirements as may be deemed necessary to maintain, insofar as can reasonably be done, the safe conditions in the spaces certified throughout the operation and shall include such additional tests and certifications as considered required.

(iv) Such qualifications and requirements shall include precautions necessary to eliminate or minimize hazards that may be present from protective coatings or residues from cargoes.

(3) Title 46 CFR 91.50-1(c)(1) covering hot work on cargo and miscellaneous vessels as follows:

(a) The provisions of "Standard for the Control of Gas Hazards on Vessels to be Repaired," NFPA No. 306, published by National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269, shall be used as a guide in conducting the inspections and issuance of certificates required by this chapter.

(b) Until an inspection has been made to determine that such operation can be undertaken with safety, no alterations, repairs, or other such operations involving riveting, welding, burning, or like fire-producing actions shall be made:

(i) Within or on the boundaries of cargo tanks which have been used to carry flammable or combustible liquid or chemicals in bulk, or within spaces adjacent to such cargo tanks; or,

(ii) Within or on the boundaries of fuel tanks; or,

(iii) To pipe lines, heating coils, pumps, fittings, or other appurtenances connected to such cargo or fuel tanks.

(c) Such inspections shall be made and evidenced as follows:

(i) In ports or places in the United States or its territories and possessions the inspection shall be made by a marine chemist certificated by the National Fire Protection Association; however, if the services of such certified marine chemist are not reasonably available, the Officer in Charge, Marine Inspection, upon the recommendation of the vessel owner and his/her contractor or their representative, shall select a person who, in the case of an individual vessel, shall be authorized to make such inspection.

(ii) If the inspection indicated that such operations can be undertaken with safety, a certificate setting forth the fact in writing and qualified as may be required, shall be issued by the certified marine chemist or the authorized person before the work is started.

(iii) Such qualifications shall include any requirements as may be deemed necessary to maintain, insofar as can reasonably be done, the safe conditions in the spaces certified throughout the operation and shall include such additional tests and certifications as considered required.

(iv) Such qualifications and requirements shall include precautions necessary to eliminate or minimize hazards that may be present from protective coatings or residues from cargoes.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-02015, filed 1/18/95, effective 3/10/95.]

WAC 296-304-030 Surface preparation and preservation—Scope and application. All sections of this chapter which include WAC 296-304-030 in the section number apply to surface preparation and preservation and WAC 296-304-03001 to 296-304-03009 applies only to shipbuilding and ship repairing.

[Order 74-25, § 296-304-030, filed 5/7/74.]

WAC 296-304-03001 Toxic cleaning solvents. (1) When toxic solvents are used, the employer shall employ one or more of the following measures to safeguard the health of employees exposed to these solvents.

(a) The cleaning operation shall be completely enclosed to prevent the escape of vapor into the working space.

(b) Either natural ventilation or mechanical exhaust ventilation shall be used to remove the vapor at the source and to dilute the concentration of vapors in the working space to a concentration which is safe for the entire work period.

(c) The employer must ensure that employees are protected against:

- Toxic vapors by suitable respiratory protective equipment that meets the requirements of chapter 296-62 WAC, Part E; and

- Exposure of skin and eyes to contact with toxic solvents and their vapors by suitable clothing and equipment.

(2) The principles in the threshold limit values to which attention is directed in WAC 296-304-02005 and applicable sections in chapter 296-62 WAC will be used by the depart-

ment of labor and industries in enforcement proceedings in defining a safe concentration of air contaminants.

(3) When flammable solvents are used, precautions shall be taken in accordance with the requirements of WAC 296-304-03009.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-03001, filed 12/26/97, effective 3/1/98. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-03001, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-03001, filed 9/22/93, effective 11/1/93; Order 76-7, § 296-304-03001, filed 3/1/76; Order 74-25, § 296-304-03001, filed 5/7/74.]

WAC 296-304-03003 Chemical paint and preservative removers. (1) The employer must ensure that employees are protected against:

- Skin contact during the handling and application of chemical paint and preservative removers; and
- Eye injury by goggles or face shields that meet the requirements of WAC 296-304-09005 (1) and (2).

(2) When using flammable paint and preservative removers precautions shall be taken in accordance with the requirements of WAC 296-304-03009.

(3) When using chemical paint and preservative removers which contain volatile and toxic solvents, such as benzol, acetone and amyl acetate, the provisions of WAC 296-304-03001 shall be applicable.

(4) The employer must ensure that employees using paint and rust removers containing strong acids or alkalies are protected by suitable face shields to prevent chemical burns on the face and neck according to the requirements of WAC 296-304-09005 (1) and (2).

(5) The employer must ensure that all employees working within range of a steam gun blast are protected by suitable face shields according to the requirements of WAC 296-304-09005 (1) and (2). Metal parts of the steam gun itself must be insulated to protect the operator against heat burns.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-03003, filed 12/26/97, effective 3/1/98; Order 74-25, § 296-304-03003, filed 5/7/74.]

WAC 296-304-03005 Mechanical paint removers. (1) Power tools.

(a) The employer must ensure that employees engaged in the removal of paints, preservatives, rusts or other coatings by means of power tools are protected against eye injury by goggles or face shields that meets the requirements of WAC 296-304-09005 (1) and (2).

(b) All portable rotating tools used for the removal of paints, preservatives, rusts or other coatings shall be adequately guarded to protect both the operator and nearby workers from flying missiles.

(c) Portable electric tools shall be grounded in accordance with the requirements of WAC 296-304-08003 (1) and (2).

(d) In a confined space, the employer must provide mechanical exhaust ventilation sufficient to keep the dust concentration to a minimum, or must protect employees by respiratory protective equipment that meets the requirements of chapter 296-62 WAC, Part E.

(2) Flame removal.

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(a) The employer must ensure that when hardened preservative coatings are removed by flame in enclosed spaces, the employees exposed to fumes are protected by air line respirators that meet the requirements of chapter 296-62 WAC, Part E. Employees performing this operation in the open air, and those exposed to the resulting fumes, must be protected by a fume filter respirator that meets the requirements of WAC 296-62-071.

(b) Flame or heat shall not be used to remove soft and greasy preservative coatings.

(3) Abrasive blasting.

(a) Equipment. Hoses and fittings used for abrasive blasting shall meet the following requirements:

(i) Hoses. Hose of a type to prevent shocks from static electricity shall be used.

(ii) Hose couplings. Hose lengths shall be joined by metal couplings secured to the outside of the hose to avoid erosion and weakening of the couplings.

(iii) Nozzles. Nozzles shall be attached to the hose by fittings that will prevent the nozzle from unintentionally becoming disengaged. Nozzle attachments shall be of metal and shall fit onto the hose externally.

(iv) Dead man control. A dead man control device shall be provided at the nozzle end of the blasting hose either to provide direct cutoff or to signal the pot tender by means of a visual and audible signal to cut off the flow, in the event the blaster loses control of the hose. The pot tender shall be available at all times to respond immediately to the signal.

(b) Replacement. Hoses and all fittings used for abrasive blasting shall be inspected frequently to insure timely replacement before an unsafe amount of wear has occurred.

(c) Personal protective equipment.

(i) The employer must ensure that abrasive blasters working in enclosed spaces are protected by abrasive blasting respirators that meet the requirements of WAC 296-24-675 and 296-62-071.

(ii) The employer must ensure that abrasive blasters working in the open are protected as required in subsection (1) of this section.

Exception: When synthetic abrasives containing less than one percent free silica are used, the employer may substitute particulate or dust filter respirators that are approved by the National Institute of Safety and Health (NIOSH) and used according to WAC 296-62-071.

(iii) The employer must ensure that employees, including machine tenders and abrasive recovery workers, working in areas where unsafe concentrations of abrasive materials and dusts are present are protected by eye and respiratory protective equipment that meets the requirements of WAC 296-304-09005 (1) and (2) and chapter 296-62 WAC, Part E.

Exception: This requirement does not apply to blasters.

(iv) The employer must ensure that a blaster is protected against injury from exposure to the blast by appropriate protective clothing, including gloves that meet the requirements of WAC 296-304-09015(1).

(v) A surge from a drop in pressure in the hose line can throw a blaster off the staging. To protect against this hazard, the employer must ensure that a blaster is protected by a per-

sonal fall arrest system, that meets the requirements of WAC 296-304-09021. The personal fall arrest system must be tied off to the ship or other structure during blasting from elevations where adequate fall protection cannot be provided by railings.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060, 98-02-006, § 296-304-03005, filed 12/26/97, effective 3/1/98. Statutory Authority: Chapter 49.17 RCW, 95-04-006, § 296-304-03005, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-03005, filed 9/22/93, effective 11/1/93; Order 76-7, § 296-304-03005, filed 3/1/76; Order 74-25, § 296-304-03005, filed 5/7/74.]

WAC 296-304-03007 Painting. All respirators required by this section must meet the requirements of chapter 296-62 WAC, Part E.

(1) Paints mixed with toxic vehicles or solvents.

(a) When employees spray paints mixed with toxic vehicles or solvents, the employer must ensure that the following conditions are met:

(i) In confined spaces, employees continuously exposed to spraying are protected by air line respirators.

(ii) In tanks or compartments, employees continuously exposed to spraying are protected by air line respirators. Where mechanical ventilation is provided, employees are protected by respirators.

(iii) In large and well ventilated areas, employees exposed to spraying are protected by respirators.

(b) The employer must ensure that where employees apply by brush paints with toxic solvents in confined spaces or other areas where lack of ventilation creates a hazard, the employees are protected by filter respirators.

(c) When flammable paints or vehicles are used, precautions shall be taken in accordance with the requirements of WAC 296-304-03009.

(d) The metallic parts of air moving devices, including fans, blowers, and jet-type air movers, and all duct work shall be electrically bonded to the vessel's structure.

(2) Paints and tank coatings dissolved in highly volatile, toxic and flammable solvents. Several organic coatings, adhesives and resins are dissolved in highly toxic, flammable and explosive solvents with flash points below 80°F. Work involving such materials shall be done only when all of the following special precautions have been taken:

(a) Sufficient exhaust ventilation shall be provided to keep the concentration of solvent vapors below ten percent of the lower explosive limit. Frequent tests shall be made by a competent person to ascertain the concentration.

(b) If the ventilation fails or if the concentration of solvent vapors rises above ten percent of the lower explosive limit, painting shall be stopped and the compartment shall be evacuated until the concentration again falls below ten percent of the lower explosive limit. If the concentration does not fall when painting is stopped, additional ventilation to bring the concentration down to ten percent of the lower explosive limit shall be provided.

(c) Ventilation shall be continued after the completion of painting until the space or compartment is gas free. The final determination as to whether the space or compartment is gas free shall be made after the ventilating equipment has been shut off for a least ten minutes.

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(d) Exhaust ducts shall discharge clear of working areas and away from sources of possible ignition. Periodic tests shall be made to ensure that the exhausted vapors are not accumulating in other areas within or around the vessel or dry dock.

(e) All motors and control equipment shall be of the explosion-proof type. Fans shall have nonferrous blades. Portable air ducts shall also be of nonferrous materials. All motors and associated control equipment shall be properly maintained and grounded.

(f) Only nonsparking paint buckets, spray guns and tools shall be used. Metal parts of paint brushes and rollers shall be insulated. Staging shall be erected in a manner which ensures that it is nonsparking.

(g) Only explosion proof lights, approved by the Underwriters' Laboratories for use in Class I, Group D atmospheres, or approved as permissible by the U.S. Bureau of Mines or the U.S. Coast Guard, shall be used.

(h) A competent person shall inspect all power and lighting cables to ensure that the insulation is in excellent condition, free of all cracks and worn spots, that there are no connections within fifty feet of the operation, that lines are not overloaded, and that they are suspended with sufficient slack to prevent undue stress or chafing.

(i) The face, eyes, head, hands and all other exposed parts of the bodies of employees handling highly volatile paints must be protected according to WAC 296-304-090. All footwear must be nonsparking, such as rubbers, rubber boots or rubber soled shoes without nails. Coveralls or other outer clothing must be made of cotton. Rubber gloves, instead of plastic gloves, must be used to protect against the danger of static sparks.

(j) No matches, lighted cigarettes, cigars, or pipes, and no cigarette lighters or ferrous articles shall be taken into the area where work is being done.

(k) All solvent drums taken into the compartment shall be placed on nonferrous surfaces and shall be grounded to the vessel. Metallic contact shall be maintained between containers and drums when materials are being transferred from one to another.

(l) Spray guns, paint pots, and metallic parts of connecting tubing shall be electrically bonded, and the bonded assembly shall be grounded to the vessel.

(m) The employer must ensure that all employees continuously in a compartment in which such painting is performed, are protected by air line respirators and by suitable protective clothing. Employees entering such compartments for a limited time must be protected by filter cartridge type respirators.

(n) The employer must ensure that all employees doing exterior paint spraying with such paints are protected by suitable filter cartridge type respirators and by suitable protective clothing.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060, 98-02-006, § 296-304-03007, filed 12/26/97, effective 3/1/98. Statutory Authority: Chapter 49.17 RCW, 95-04-006, § 296-304-03007, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-03007, filed 9/22/93, effective 11/1/93; Order 76-7, § 296-304-03007, filed 3/1/76; Order 74-25, § 296-304-03007, filed 5/7/74.]

(1999 Ed.)

WAC 296-304-03009 Flammable liquids. (1) In all cases when liquid solvents, paint and preservative removers, paints or vehicles, other than those covered by WAC 296-304-03007(2), are capable of producing a flammable atmosphere under the conditions of use the following precautions shall be taken:

(a) Smoking, open flames, arcs and spark-producing equipment shall be prohibited in the area.

(b) Ventilation shall be provided in sufficient quantities to keep the concentration of vapors below ten percent of their lower explosive limit. Frequent tests shall be made by a competent person to ascertain the concentration.

(c) Scrapings and rags soaked with these materials shall be kept in a covered metal container.

(d) Only explosion proof lights, approved by the Underwriters' Laboratories for use in Class I, Group D atmospheres, or approved as permissible by the U.S. Bureau of Mines or the U.S. Coast Guard, shall be used.

(e) A competent person shall inspect all power and lighting cables to ensure that the insulation is in excellent condition, free of all cracks and worn spots, that there are no connections within fifty feet of the operation, that lines are not overloaded, and that they are suspended with sufficient slack to prevent undue stress or chafing.

(f) Suitable fire extinguishing equipment shall be immediately available in the work area and shall be maintained in a state of readiness for instant use.

[Order 74-25, § 296-304-03009, filed 5/7/74.]

WAC 296-304-040 Welding, cutting and heating—Scope and application. All sections of this chapter which include WAC 296-304-040 in the section number apply to welding, cutting and heating.

[Order 74-25, § 296-304-040, filed 5/7/74.]

WAC 296-304-04001 Ventilation and protection in welding, cutting and heating. (1) Mechanical ventilation requirements.

(a) For the purposes of this section, mechanical ventilation shall meet the following requirements:

(i) Mechanical ventilation shall consist of either general mechanical ventilation systems or local exhaust systems.

(ii) General mechanical ventilation shall be of sufficient capacity and so arranged as to produce the number of air changes necessary to maintain welding fumes and smoke within safe limits.

(iii) Local exhaust ventilation shall consist of freely movable hoods intended to be placed by the welder or burner as close as practicable to the work. This system shall be of sufficient capacity and so arranged as to remove fumes and smoke at the source and keep the concentration of them in the breathing zone within safe limits.

(iv) Contaminated air exhausted from a working space shall be discharged into the open air or otherwise clear of the source of intake air.

(v) All air replacing that withdrawn shall be clean and respirable.

(vi) Oxygen shall not be used for ventilation purposes, comfort cooling, blowing dust or dirt from clothing, or for cleaning the work area.

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(2) Welding, cutting and heating in confined spaces.

(a) Except as provided in WAC 296-304-04001 (2)(c) and (3)(b), either general mechanical or local exhaust ventilation meeting the requirements of (1) of this section shall be provided whenever welding, cutting or heating is performed in a confined space.

(b) The means of access shall be provided to a confined space and ventilation ducts to this space shall be arranged in accordance with WAC 296-304-05011 (2)(a) and (b).

(c) When sufficient ventilation cannot be obtained without blocking the means of access, employees in the confined space shall be protected by air line respirators in accordance with the requirements of chapter 296-62 WAC, Part E, and an employee on the outside of such a confined space shall be assigned to maintain communication with those working within it and to aid them in an emergency.

(3) Welding, cutting or heating of metals of toxic significance.

(a) Welding, cutting or heating in any enclosed spaces aboard the vessel involving the metals specified in this subsection shall be performed with either general mechanical or local exhaust ventilation meeting the requirements of (1) of this section.

(i) Zinc-bearing base or filler metals or metals coated with zinc-bearing materials.

(ii) Lead base metals.

(iii) Cadmium-bearing filler materials.

(iv) Chromium-bearing metals or metals coated with chromium-bearing materials.

(b) Welding, cutting, or heating in any enclosed spaces aboard the vessel involving the metals specified in this subsection shall be performed with local exhaust ventilation in accordance with the requirements of (1) of this section or employees shall be protected by air line respirators in accordance with the requirements of chapter 296-62 WAC, Part E.

(i) Metals containing lead, other than as an impurity, or metals coated with lead-bearing materials.

(ii) Cadmium-bearing or cadmium coated base metals.

(iii) Metals coated with mercury-bearing metals.

(iv) Beryllium-containing base or filler metals. Because of its high toxicity, work involving beryllium shall be done with both local exhaust ventilation and air line respirators.

(c) Employees performing such operations in the open air shall be protected by filter type respirators in accordance with the requirements of WAC 296-304-09003, except that employees performing such operations on beryllium-containing base or filler metals shall be protected by air line respirators in accordance with the requirements of chapter 296-62 WAC, Part E.

(d) Other employees exposed to the same atmosphere as the welders or burners shall be protected in the same manner as the welder or burner.

(4) Inert-gas metal-arc welding.

(a) Since the inert-gas metal-arc welding process involves the production of ultraviolet radiation of intensities of 5 to 30 times that produced during shielded metal-arc welding, the decomposition of chlorinated solvents by ultraviolet rays, and the liberation of toxic fumes and gases, employees shall not be permitted to engage in, or be exposed

to the process until the following special precautions have been taken:

(i) The use of chlorinated solvents shall be kept at least two hundred feet from the exposed arc, and surfaces prepared with chlorinated solvents shall be thoroughly dry before welding is permitted on such surfaces.

(ii) Helpers and other employees in the area not protected from the arc by screening as provided in WAC 206-304-04011(5) shall be protected by filter lenses meeting the requirements of WAC 296-304-09001 (1) and (3). When two or more welders are exposed to each other's arc, filter lens goggles of a suitable type meeting the requirements of WAC 296-304-09001 (1) and (3) shall be worn under welding helmets or hand shields to protect the welder against flashes and radiant energy when either the helmet is lifted or the shield is removed.

(iii) Welders and other employees who are exposed to radiation shall be suitably protected so that the skin is covered completely to prevent burns and other damage by ultraviolet rays. Welding helmets and hand shields shall be free of leaks and openings, and free of highly reflective surfaces.

(iv) When inert-gas metal-arc welding is being performed on stainless steel, the requirements of (3)(b) of this section shall be met to protect against dangerous concentrations of nitrogen dioxide.

(5) General welding, cutting and heating.

(a) Welding, cutting and heating not involving conditions or materials described in (2), (3) or (4) of this section may normally be done without mechanical ventilation or respiratory protective equipment, but where, because of unusual physical or atmospheric conditions, an unsafe accumulation of contaminants exists, suitable mechanical ventilation or respiratory protective equipment shall be provided.

(b) Employees performing any type of welding, cutting or heating shall be protected by suitable eye protective equipment in accordance with the requirements of WAC 296-304-09001 (1) and (3).

(6) Residues and cargos of metallic ores.

(a) Residues and cargos of metallic ores of toxic significance shall be removed from the area or protected from the heat before welding, cutting or heating is begun.

[Statutory Authority: Chapter 49.17 RCW, 95-04-006, § 296-304-04001, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-04001, filed 9/22/93, effective 11/1/93; Order 74-25, § 296-304-04001, filed 5/7/74.]

WAC 296-304-04003 Fire prevention. (1) When hot work is performed below decks or in other situations in which accidental fire would jeopardize the safety of employees, the following precautions shall be taken.

(2) When practical, objects to be welded, cut or heated shall be moved to a designated safe location or, if the object to be welded, cut or heated cannot be readily moved, all movable fire hazards including residues of combustible bulk cargos in the vicinity shall be taken to a safe place.

(3) If the object to be welded, cut or heated cannot be moved and if all the fire hazards including combustible cargos cannot be removed, positive means shall be taken to confine the heat, sparks, and slag, and to protect the immovable fire hazards from them.

[Title 296 WAC—p. 2414]

(4) No welding, cutting or heating shall be done where the application of flammable paints or the presence of other flammable compounds or of heavy dust concentrations creates a hazard.

(5) Suitable fire extinguishing equipment shall be immediately available in the work area and shall be maintained in a state of readiness for instant use. In addition, when hot work is being performed aboard a vessel and pressure is not available on the vessel's fire system, an auxiliary supply of water shall be made available where practicable, consistent with avoiding freezing of the lines or hose.

(6) When the welding, cutting, or heating operation is such that normal fire prevention precautions are not sufficient, additional personnel shall be assigned to guard against fire while the actual welding, cutting, or heating operation is being performed and for a sufficient period of time after completion of the work to insure that no possibility of fire exists. Such personnel shall be instructed as to the specific anticipated fire hazards and how the fire fighting equipment provided is to be used.

(7) When welding, cutting or heating is performed on tank shells, decks, overheads and bulkheads, since direct penetration of sparks or heat transfer may introduce a fire hazard to an adjacent compartment, the same precautions shall be taken on the opposite side as are taken on the side on which the welding is being performed.

(8) In order to eliminate the possibility of fire in enclosed spaces as a result of gas escaping through leaking or improperly closed torch valves, the gas supply to the torch shall be positively shut off at some point outside the enclosed space whenever the torch is not to be used or whenever the torch is left unattended for a substantial period of time, such as during the lunch hour. Overnight and at the change of shifts the torch and hose shall be removed from the confined space. Open end fuel gas and oxygen hoses shall be immediately removed from enclosed spaces when they are disconnected from the torch or other gas consuming device.

(9) Vaporizing liquid extinguishers shall not be used in enclosed spaces.

(10) Except when the contents are being removed or transferred, drums, pails, and other containers which contain or have contained flammable liquids shall be kept closed. Empty containers shall be removed to a safe area apart from hot work operations, or open flames.

[Order 76-7, § 296-304-04003, filed 3/1/76; Order 74-25, § 296-304-04003, filed 5/7/74.]

WAC 296-304-04005 Welding, cutting and heating in way of preservative coatings. (1) Before welding, cutting or heating is commenced on any surface covered by a preservative coating whose flammability is not known, a test shall be made by a competent person to determine its flammability. Preservative coatings shall be considered to be highly flammable when scrapings burn with extreme rapidity.

(2) Precautions shall be taken to prevent ignition of highly flammable hardened preservative coatings. When coatings are determined to be highly flammable they shall be stripped from the area to be heated to prevent ignition. A 1 1/2-inch or larger fire hose with fog nozzle, which has been uncoiled and placed under pressure, shall be immediately

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available for instant use in the immediate vicinity, consistent with avoiding freezing of the hose.

(3) Protection against toxic preservative coatings.

(a) In enclosed spaces all surfaces covered with toxic preservatives shall be stripped of all toxic coatings for a distance of at least 4 inches from the area of heat application or the employees shall be protected by air line respirators meeting the requirements of chapter 296-62 WAC, Part E.

(b) In the open air employees shall be protected by a filter type respirator in accordance with the requirements of chapter 296-62 WAC, Part E.

(4) Before welding, cutting or heating is commenced in enclosed spaces on metals covered by soft and greasy preservatives, the following precautions shall be taken:

(a) A competent person shall test the atmosphere in the space to ensure that it does not contain explosive vapors, since there is a possibility that some soft and greasy preservatives may have flash points below temperatures which may be expected to occur naturally. If such vapors are determined to be present, no hot work shall be commenced until such precautions have been taken as will ensure that the welding, cutting or heating can be performed in safety.

(b) The preservative coatings shall be removed for a sufficient distance from the area to be heated to ensure that the temperature of the unstripped metal will not be appreciably raised. Artificial cooling of the metal surrounding the heated area may be used to limit the size of the area required to be cleaned. The prohibition contained in WAC 296-304-03005 (2)(b) shall apply.

(5) Immediately after welding, cutting or heating is commenced in enclosed spaces on metal covered by soft and greasy preservatives, and at frequent intervals thereafter, a competent person shall make tests to ensure that no flammable vapors are being produced by the coatings. If such vapors are determined to be present, the operation shall be stopped immediately and shall not be resumed until such additional precautions have been taken as are necessary to ensure that the operation can be resumed safely.

[Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-04005, filed 1/18/95, effective 3/10/95; 93-19-142 (Order 93-04), § 296-304-04005, filed 9/22/93, effective 11/1/93; Order 74-25, § 296-304-04005, filed 5/7/74.]

WAC 296-304-04007 Welding, cutting and heating of hollow metal containers and structures not covered by WAC 296-304-02003. (1) Drums, containers, or hollow structures which have contained toxic or flammable substances shall, before welding, cutting, or heating is undertaken on them, either be filled with water or thoroughly cleaned of such substances and ventilated and tested.

(2) Before heat is applied to a drum, container, or hollow structure, a vent or opening shall be provided for the release of any built-up pressure during the application of heat.

(3) Before welding, cutting, heating or brazing is begun on structural voids such as skegs, bilge keels, fair waters, masts, booms, support stanchions, pipe stanchions or railings, a competent person shall inspect the object and, if necessary, test it for the presence of flammable liquids or vapors. If flammable liquids or vapors are present, the object shall be made safe.

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(4) Objects such as those listed in (3) of this section shall also be inspected to determine whether water or other non-flammable liquids are present which, when heated, would build up excessive pressure. If such liquids are determined to be present, the object shall be vented, cooled, or otherwise made safe during the application of heat.

(5) Jacketed vessels shall be vented before and during welding, cutting or heating operations in order to release any pressure which may build up during the application of heat.

[Order 76-7, § 296-304-04007, filed 3/1/76; Order 74-25, § 296-304-04007, filed 5/7/74.]

WAC 296-304-04009 Gas welding and cutting. (1) Transporting, moving and storing compressed gas cylinders.

(a) Valve protection caps shall be in place and secure. Oil shall not be used to lubricate protection caps.

(b) When cylinders are hoisted, they shall be secured on a cradle, slingboard or pallet. They shall not be hoisted by means of magnets or choker slings.

(c) Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dropped, struck, or permitted to strike each other violently.

(d) When cylinders are transported by vehicle, they shall be secured in position.

(e) Valve protection caps shall not be used for lifting cylinders from one vertical position to another. Bars shall not be used under valves or valve protection caps to pry cylinders loose when frozen. Warm, not boiling, water shall be used to thaw cylinders loose.

(f) Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators shall be removed and valve protection caps put in place before cylinders are moved.

(g) A suitable cylinder truck, chain, or other steadying device shall be used to keep cylinders from being knocked over while in use.

(h) When work is finished, when cylinders are empty or when cylinders are moved at any time, the cylinder valves shall be closed.

(i) Acetylene cylinders shall be secured in an upright position at all times except, if necessary, for short periods of time while cylinders are actually being hoisted or carried.

(2) Placing cylinders.

(a) Cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag or flame will not reach them. When this is impractical, fire resistant shields shall be provided.

(b) Cylinders shall be placed where they cannot become part of an electrical circuit. Electrodes shall not be struck against a cylinder to strike an arc.

(c) Fuel gas cylinders shall be placed with valve end up whenever they are in use. They shall not be placed in a location where they would be subject to open flame, hot metal, or other sources of artificial heat.

(d) Cylinders containing oxygen or acetylene or other fuel gas shall not be taken into confined spaces.

(3) Treatment of cylinders.

(a) Cylinders, whether full or empty, shall not be used as rollers or supports.

(b) No person other than the gas supplier shall attempt to mix gases in a cylinder. No one except the owner of the cylinder or person authorized by him shall refill a cylinder. No one shall use a cylinder's contents for purposes other than those intended by the supplier. Only cylinders bearing Interstate Commerce Commission identification and inspection markings shall be used.

(c) No damaged or defective cylinder shall be used.

(4) Use of fuel gas. The employer shall thoroughly instruct employees in the safe use of fuel gas, as follows:

(a) Before connecting a regulator to a cylinder valve, the valve shall be opened slightly and closed immediately. (This action is generally termed "cracking" and is intended to clear the valve of dust or dirt that might otherwise enter the regulator.) The person cracking the valve shall stand to one side of the outlet, not in front of it. The valve of a fuel gas cylinder shall not be cracked where the gas would reach welding work, sparks, flame or other possible sources of ignition.

(b) The cylinder valve shall always be opened slowly to prevent damage to the regulator. To permit quick closing, valves on fuel gas cylinders shall not be opened more than 1 1/2 turns. When a special wrench is required, it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel gas flow can be shut off quickly in case of emergency. In the case of a manifolded or coupled cylinders, at least one such wrench shall always be available for immediate use. Nothing shall be placed on top of a fuel gas cylinder, when in use, which may damage the safety device or interfere with the quick closing of the valve.

(c) Fuel gas shall not be used from cylinders through torches or other devices which are equipped with shut-off valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.

(d) Before a regulator is removed from a cylinder valve, the cylinder valve shall always be closed and the gas released from the regulator.

(e) If, when the valve on a fuel gas cylinder is opened, there is found to be a leak around the valve stem, the valve shall be closed and the gland nut tightened. If this action does not stop the leak, the use of the cylinder shall be discontinued, and it shall be properly tagged and removed from the vessel. In the event that fuel gas should leak from the cylinder valve rather than from the valve stem and the gas cannot be shut off, the cylinder shall be properly tagged and removed from the vessel. If a regulator attached to a cylinder valve will effectively stop a leak through the valve seat the cylinder need not be removed from the vessel.

(f) If a leak should develop at a fuse plug or other safety device, the cylinder shall be removed from the vessel.

(5) Fuel gas and oxygen manifolds.

(a) Fuel gas and oxygen manifolds shall bear the name of the substance they contain in letters at least one (1) inch high which shall be either painted on the manifold or on a sign permanently attached to it.

(b) Fuel gas and oxygen manifolds shall be placed in safe and accessible locations in the open air. They shall not be located within enclosed spaces.

(c) Manifold hose connections, including both ends of the supply hose that lead to the manifold, shall be such that the hose cannot be interchanged between fuel gas and oxygen

manifolds and supply header connections. Adapters shall not be used to permit the interchange of hose. Hose connections shall be kept free of grease and oil.

(d) When not in use, manifold and header hose connections shall be capped.

(e) Nothing shall be placed on top of a manifold, when in use, which will damage the manifold or interfere with the quick closing of the valves.

(6) Hose.

(a) Fuel gas hose and oxygen hose shall be easily distinguishable from each other. The contrast may be made by different colors or by surface characteristics readily distinguishable by the sense of touch. Oxygen and fuel gas hoses shall not be interchangeable. A single hose having more than one gas passage, a wall failure of which would permit the flow of one gas into the other gas passage, shall not be used.

(b) When parallel sections of oxygen and fuel gas hose are taped together, not more than 4 inches out of 8 inches shall be covered by tape.

(c) All hose carrying acetylene, oxygen, natural or manufactured fuel gas, or any gas or substance which may ignite or enter into combustion or be in any way harmful to employees, shall be inspected at the beginning of each shift. Defective hose shall be removed from service.

(d) Hose which has been subjected to flashback or which shows evidence of severe wear or damage shall be tested to twice the normal pressure to which it is subject, but in no case less than two hundred psi. Defective hose or hose in doubtful condition shall not be used.

(e) Hose couplings shall be of the type that cannot be unlocked or disconnected by means of a straight pull without rotary motion.

(f) Boxes used for the stowage of gas hose shall be ventilated.

(7) Torches.

(a) Clogged torch tip openings shall be cleaned with suitable cleaning wires, drills or other devices designed for such purpose.

(b) Torches shall be inspected at the beginning of each shift for leaking shutoff valves, hose couplings, and tip connections. Defective torches shall not be used.

(c) Torches shall be lighted by friction lighters or other approved devices, and not by matches or from hot work.

(8) Pressure regulators. Oxygen and fuel gas pressure regulators including their related gauges shall be in proper working order while in use.

[Order 74-25, § 296-304-04009, filed 5/7/74.]

WAC 296-304-04011 Arc welding and cutting. (1) Manual electrode holders.

(a) Only manual electrode holders which are specifically designed for arc welding and cutting and are of a capacity capable of safely handling the maximum rated current required by the electrodes shall be used.

(b) Any current carrying parts passing through the portion of the holder which the arc welder or cutter grips in his hand, and the outer surfaces of the jaws of the holder, shall be fully insulated against the maximum voltage encountered to ground.

(2) Welding cables and connectors.

(a) All arc welding and cutting cables shall be of the completely insulated, flexible type, capable of handling the maximum current requirements of the work in progress, taking into account the duty cycle under which the arc welder or cutter is working.

(b) Only cable free from repair or splices for a minimum distance of ten feet from the cable end to which the electrode holder is connected shall be used, except that cables with standard insulated connectors or with splices whose insulating quality is equal to that of the cable are permitted.

(c) When it becomes necessary to connect or splice lengths of cable one to another, substantial insulated connectors of a capacity at least equivalent to that of the cable shall be used. If connections are effected by means of cable lugs, they shall be securely fastened together to give good electrical contact, and the exposed metal parts of the lugs shall be completely insulated.

(d) Cables in poor repair shall not be used. When a cable, other than the cable lead referred to in (b), becomes worn to the extent of exposing bare conductors, the portion thus exposed shall be protected by means of rubber and friction tapes or other equivalent insulation.

(3) Ground returns and machine grounding.

(a) A ground return cable shall have a safe current carrying capacity equal to or exceeding the specified maximum output capacity of the arc welding or cutting unit which it services. When a single ground return cable services more than one unit, its safe current carrying capacity shall equal or exceed the total specified maximum output capacities of all the units which it services.

(b) Structures or pipe lines, except pipelines containing gases or flammable liquids or conduits containing electrical circuits, may be used as part of the ground return circuit, provided that the pipe or structure has a current carrying capacity equal to that required by (2).

(c) When a structure or pipe line is employed as a ground return circuit, it shall be determined that the required electrical contact exists at all joints. The generation of an arc, sparks or heat at any point shall cause rejection of the structure as a ground circuit.

(d) When a structure or pipe line is continuously employed as a ground return circuit, all joints shall be bonded, and periodic inspections shall be conducted to ensure that no condition of electrolysis or fire hazard exists by virtue of such use.

(e) The frames of all arc welding and cutting machines shall be grounded either through a third wire in the cable containing the circuit conductor or through a separate wire which is grounded at the source of the current. Grounding circuits, other than by means of the vessel's structure, shall be checked to ensure that the circuit between the ground and the grounded power conductor has resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

(f) All ground connections shall be inspected to ensure that they are mechanically strong and electrically adequate for the required current.

(4) Operating instructions. Employers shall instruct employees in the safe means of arc welding and cutting as follows:

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(a) When electrode holders are to be left unattended, the electrodes shall be removed and the holders shall be so placed or protected that they cannot make electrical contact with employees or conducting objects.

(b) Hot electrode holders shall not be dipped in water, since to do so may expose the arc welder or cutter to electric shock.

(c) When the arc welder or cutter has occasion to leave his work or to stop work for any appreciable length of time, or when the arc welding or cutting machine is to be moved, the power supply switch to the equipment shall be opened.

(d) Any faulty or defective equipment shall be reported to the supervisor.

(5) Shielding. Whenever practicable, all arc welding and cutting operations shall be shielded by noncombustible or flame-proof screens which will protect employees and other persons working in the vicinity from the direct rays of the arc.

[Order 74-25, § 296-304-04011, filed 5/7/74.]

WAC 296-304-04013 Uses of fissionable material in ship-breaking, shipbuilding and ship repairing. (1) In ship-breaking, shipbuilding and ship repairing and related activities involving the use of and exposure to sources of ionizing radiation not only on conventionally powered but also on nuclear powered vessels, the applicable provisions of the Atomic Energy Commission's Standards for Protection Against Radiation (10 CFR Part 20), relating to protection against occupational radiation exposure, shall apply.

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

[Order 76-7, § 296-304-04013, filed 3/1/76; Order 74-25, § 296-304-04013, filed 5/7/74.]

WAC 296-304-050 Scaffolds, ladders and other working surfaces—Scope and application. All sections of this chapter which include WAC 296-304-050 in the section number apply to scaffolds, ladders and other working surfaces.

[Order 74-25, § 296-304-050, filed 5/7/74.]

WAC 296-304-05001 Scaffolds or staging. (1) General requirements.

(a) All scaffolds and their supports whether of lumber, steel or other material, shall be capable of supporting the load they are designed to carry with a safety factor of not less than four.

(b) All lumber used in the construction of scaffolds shall be spruce, fir, long leaf yellow pine, Oregon pine or wood of equal strength. The use of hemlock, short leaf yellow pine, or short fiber lumber is prohibited.

(c) Lumber dimensions as given are nominal except where given in fractions of an inch.

(d) All lumber used in the construction of scaffolds shall be sound, straight-grained, free from cross grain, shakes and

large, loose or dead knots. It shall also be free from dry rot, large checks, worm holes or other defects which impair its strength or durability.

(e) Scaffolds shall be maintained in a safe and secure condition. Any component of the scaffold which is broken, burned or otherwise defective shall be replaced.

(f) Barrels, boxes, cans, loose bricks, or other unstable objects shall not be used as working platforms or for the support of planking intended as scaffolds or working platforms.

(g) No scaffold shall be erected, moved, dismantled or altered except under the supervision of competent persons.

(h) No welding, burning, riveting or open flame work shall be performed on any staging suspended by means of fiber rope.

(i) Lifting bridles on working platforms suspended from cranes shall consist of four legs so attached that the stability of the platform is assured.

(j) Unless the crane hook has a safety latch or is moused, the lifting bridles on working platforms suspended from cranes shall be attached by shackles to the lower lifting block or other positive means shall be taken to prevent them from becoming accidentally disengaged from the crane hook.

(2) Independent pole wood scaffolds.

(a) All pole uprights shall be set plumb. Poles shall rest on a foundation of sufficient size and strength to distribute the load and to prevent displacement.

(b) In light-duty scaffolds not more than 24 feet in height, poles may be spliced by overlapping the ends not less than 4 feet and securely nailing them together. A substantial cleat shall be nailed to the lower section to form a support for the upper section except when bolted connections are used.

(c) All other poles to be spliced shall be squared at the ends of each splice, abutted, and rigidly fastened together by not less than two cleats securely nailed or bolted thereto. Each cleat shall overlap each pole end by at least 24 inches and shall have a width equal to the face of the pole to which it is attached. The combined cross sectional area of the cleats shall be not less than the cross sectional area of the pole.

(d) Ledgers shall extend over two consecutive pole spaces and shall overlap the poles at each end by not less than 4 inches. They shall be left in position to brace the poles as the platform is raised with the progress of the work. Ledgers shall be level and shall be securely nailed or bolted to each pole and shall be placed against the inside face of each pole.

(e) All bearers shall be set with their greater dimension vertical and shall extend beyond the ledgers upon which they rest.

(f) Diagonal bracing shall be provided between the parallel poles, and cross bracing shall be provided between the inner and outer poles or from the outer poles to the ground.

(g) Minimum dimensions and spacing of members shall be in accordance with Table E-1 in WAC 296-304-07011.

(h) Platform planking shall be in accordance with the requirements of (8) of this section.

(i) Backrails and toeboards shall be in accordance with the requirements of (9) of this section.

(3) Independent pole metal scaffolds.

(a) Metal scaffold members shall be maintained in good repair and free of corrosion.

(b) All vertical and horizontal members shall be fastened together with a coupler or locking device which will form a positive connection. The locking device shall be of a type which has no loose parts.

(c) Posts shall be kept plumb during erection and the scaffold shall be subsequently kept plumb and rigid by means of adequate bracing.

(d) Posts shall be fitted with bases supported on a firm foundation to distribute the load. When wooden sills are used, the bases shall be fastened thereto.

(e) Bearers shall be located at each set of posts, at each level, and at each intermediate level where working platforms are installed.

(f) Tubular bracing shall be applied both lengthwise and crosswise as required.

(g) Platform planking shall be in accordance with the requirements of (8) of this section.

(h) Backrails and toeboards shall be in accordance with the requirements of (9) of this section.

(4) Wood trestle and extension trestle ladders.

(a) The use of trestle ladders, or extension sections or base sections of extension trestle ladders longer than 20 feet is prohibited. The total height of base and extension may, however, be more than 20 feet.

(b) The minimum dimensions of the side rails of the trestle ladder, or the base sections of the extension trestle ladder, shall be as follows:

(i) Ladders up to and including those 16 feet long shall have side rails of not less than 1 5/16 x 2 3/4 inch lumber.

(ii) Ladders over 16 feet long and up to and including those 20 feet long shall have side rails of not less than 1 5/16 x 3 inch lumber.

(c) The side rails of the extension section of the extension trestle ladder shall be parallel and shall have minimum dimensions as follows:

(i) Ladders up to and including 12 feet long shall have side rails of not less than 1 5/16 x 2 1/4 inch lumber.

(ii) Ladders over 12 feet long and up to and including those 16 feet long shall have side rails of not less than 1 5/16 x 2 1/2 inch lumber.

(iii) Ladders over 16 feet long and up to and including those 20 feet long shall have side rails of not less than 1 5/16 x 3 inch lumber. (Rev. 2-17-76)

(d) Trestle ladders and base sections of extension trestle ladders shall be so spread that when in an open position the spread of the trestle at the bottom, inside to inside, shall be not less than 5 1/2 inches per foot of the length of the ladder.

(e) The width between the side rails at the bottom of the trestle ladder or of the base section of the extension trestle ladder shall be not less than 21 inches for all ladders and sections 6 feet or less in length. For longer lengths of ladder the width shall be increased at least 1 inch for each additional foot of length. The width between the side rails of the extension section of the trestle ladder shall be not less than 12 inches.

(f) In order to limit spreading, the top ends of the side rails of both the trestle ladder and of the base section of the extension trestle ladder shall be beveled, or of equivalent construction, and shall be provided with a metal hinge.

(g) A metal spreader or locking device to hold the front and back sections in an open position, and to hold the extension section securely in the elevated position, shall be a component of each trestle ladder or extension trestle ladder.

(h) Rungs shall be parallel and level. On the trestle ladder, or on the base section of the extension trestle ladder, rungs shall be spaced not less than 8 inches nor more than 18 inches apart; on the extension section of the extension trestle ladder, rungs shall be spaced not less than 6 inches nor more than 12 inches apart.

(i) Platform planking shall be in accordance with the requirements of (8) of this section, except that the width of the platform planking shall not exceed the distance between the siderails.

(j) Backrails and toeboards shall be in accordance with the requirements of (9) of this section.

(5) Painters' suspended scaffolds.

(a) The supporting hooks of swinging scaffolds shall be constructed to be equivalent in strength to mild steel or wrought iron, shall be forged with care, shall be not less than 7/8 inch in diameter, and shall be secured to a safe anchorage at all times.

(b) The ropes supporting a swinging scaffold shall be equivalent in strength to first-grade 3/4 inch diameter manila rope properly rigged into a set of standard 6 inch blocks consisting of at least one double and one single block.

(c) Manila and wire ropes shall be carefully examined before each operation and thereafter as frequently as may be necessary to ensure their safe condition.

(d) Each end of the scaffold platform shall be supported by a wrought iron or mild steel stirrup or hanger, which in turn is supported by the suspension ropes.

(e) Stirrups shall be constructed so as to be equivalent in strength to wrought iron 3/4 inch in diameter.

(f) The stirrups shall be formed with a horizontal bottom member to support the platform, shall be provided with means to support the guardrail and midrail and shall have a loop or eye at the top for securing the supporting hook on the block.

(g) Two or more swinging scaffolds shall not at any time be combined into one by bridging the distance between them with planks or any other form of platform.

(h) No more than two men shall be permitted to work at one time on a swinging scaffold built to the minimum specifications contained in this section. Where heavier construction is used, the number of men permitted to work on the scaffold shall be determined by the size and the safe working load of the scaffold.

(i) Backrails and toeboards shall be in accordance with the requirements of (9) of this section.

(j) The swinging scaffold platform shall be one of the three types described in (k), (l), and (m) of this section.

(k) The ladder-type platform consists of boards upon a horizontal ladder-like structure, referred to herein as the ladder, the side rails of which are parallel. If this type of platform is used the following requirements shall be met:

(i) The width between the side rails shall be no more than 20 inches.

(ii) The side rails of ladders in ladder-type platforms shall be equivalent in strength to a beam of clear straight-

grained spruce of the dimensions contained in Table E-2 in WAC 296-304-07013.

(iii) The side rails shall be tied together with tie rods. The tie rods shall be not less than 5/16 inch in diameter, located no more than 5 feet apart, pass through the rails, and be riveted up tight against washers at both ends.

(iv) The rungs shall be of straight-grained oak, ash, or hickory, not less than 1 1/8 inches diameter, with 7/8 inch tenons mortised into the side rails not less than 7/8 inch and shall be spaced no more than 18 inches on centers.

(v) Flooring strips shall be spaced no more than 5/8 inch apart except at the side rails, where 1 inch spacing is permissible.

(vi) Flooring strips shall be cleated on their undersides.

(l) The plank-type platform consists of planks supported on the stirrups or hangers. If this type of platform is used, the following requirements shall be met:

(i) The planks of plank-type platforms shall be not less than 2 x 10 inch lumber.

(ii) The platform shall be no more than 24 inches in width.

(iii) The planks shall be tied together by cleats of not less than 1 x 6 inch lumber, nailed on their undersides at intervals of not more than 4 feet.

(iv) The planks shall extend not less than 6 inches nor more than 18 inches beyond the supporting stirrups.

(v) A cleat shall be nailed across the platform on the underside at each end outside the stirrup to prevent the platform from slipping off the stirrup.

(vi) Stirrup supports shall be not more than 10 feet apart.

(m) The beam-type platform consists of longitudinal side stringers with cross beams set on edge and spaced not more than 4 feet apart on which longitudinal platform planks are laid. If this type platform is used the following requirements shall be met:

(i) The side stringers shall be of sound, straight-grained lumber, free from knots, and of not less than 2 x 6 inch lumber, set on edge.

(ii) The stringers shall be supported on the stirrups with a clear span between stirrups of not more than 16 feet.

(iii) The stringers shall be bolted to the stirrups by U-bolts passing around the stirrups and bolted through the stringers with nuts drawn up tight on the inside face.

(iv) The ends of the stringers shall extend beyond the stirrups not less than 6 inches nor more than 12 inches at each end of the platform.

(v) The platform shall be supported on cross beams of 2 x 6 inch lumber between the side stringers securely nailed thereto and spaced not more than 4 feet on centers.

(vi) The platform shall be not more than 24 inches wide.

(vii) The platform shall be formed of boards 7/8 inch in thickness by not less than 6 inches in width, nailed tightly together, and extending to the outside face of the stringers.

(viii) The ends of all platform boards shall rest on the top of the cross beams, shall be securely nailed, and at no intermediate points in the length of the platform shall there be any cantilever ends.

(6) Horse scaffolds.

(a) The minimum dimensions of lumber used in the construction of horses shall be in accordance with Table E-3 in WAC 296-304-07011.

(b) Horses constructed of materials other than lumber shall provide the strength, rigidity and security required of horses constructed of lumber.

(c) The lateral spread of the legs shall be equal to not less than one-third of the height of the horse.

(d) All horses shall be kept in good repair, and shall be properly secured when used in staging or in locations where they may be insecure.

(e) Platform planking shall be in accordance with the requirements of (8) of this section.

(f) Backrails and toeboards shall be in accordance with (9) of this section.

(7) Other types of scaffolds.

(a) Scaffolds of a type for which specifications are not contained in this section shall meet the general requirements of (1), (8) and (9) of this section, shall be in accordance with recognized principles of design and shall be constructed in accordance with accepted standards covering such equipment.

(8) Scaffold or platform planking.

(a) Except as otherwise provided in (5)(k) and (m), platform planking shall be of not less than 2 x 10 inch lumber. Platform planking shall be straight-grained and free from large or loose knots and may be either rough or dressed.

(b) Platforms of staging shall be not less than two 10 inch planks in width except in such cases as the structure of the vessel or the width of the trestle ladders make it impossible to provide such a width.

(c) Platform planking shall project beyond the supporting members at either end by at least 6 inches but in no case shall project more than 12 inches unless the planks are fastened to the supporting members.

(d) Table E-4 in WAC 296-304-07011 shall be used as a guide in determining safe loads for scaffold planks.

(9) Backrails and toeboards.

(a) Scaffolding, staging, runways, or working platforms which are supported or suspended more than 5 feet above a solid surface, or at any distance above the water, shall be provided with a railing which has a top rail whose upper surface is from 42 to 45 inches above the upper surface of the staging, platform, or runway and a midrail located halfway between the upper rail and the staging, platform, or runway.

(b) Rails shall be of 2 x 4 inch lumber, flat bar or pipe. When used with rigid supports, taut wire or fiber rope of adequate strength may be used. If the distance between supports is more than 8 feet, rails shall be equivalent in strength to 2 x 4 inch lumber. Rails shall be firmly secured. Where exposed to hot work or chemicals, fiber rope rails shall not be used.

(c) Rails may be omitted where the structure of the vessel prevents their use. When rails are omitted employees working more than 5 feet above solid surfaces shall be protected by safety belts and life lines meeting the requirements of WAC 296-304-09007(2), and employees working over water shall be protected by personal flotation devices meeting the requirements of WAC 296-304-09007(1).

(d) Employees working from swinging scaffolds which are triced out of a vertical line below their supports or from

scaffolds on paint floats subject to surging, shall be protected against falling toward the vessel by a railing or a safety belt and line attached to the backrail.

(e) When necessary, to prevent tools and materials from falling on men below, toeboards of not less than 1 x 4 inch lumber shall be provided.

(10) Access to staging.

(a) Access from below to staging more than 5 feet above a floor, deck or the ground shall consist of well secured stairways, cleated ramps, fixed or portable ladders meeting the applicable requirements of WAC 296-304-05003 or rigid type noncollapsible trestles with parallel and level rungs.

(b) Ramps and stairways shall be provided with 36-inch handrails with midrails.

(c) Ladders shall be so located or other means shall be taken so that it is not necessary for employees to step more than one foot from the ladder to any intermediate landing or platform.

(d) Ladders forming integral parts of prefabricated staging are deemed to meet the requirements of these regulations.

(e) Access from above to staging more than 3 feet below the point of access shall consist of a straight, portable ladder meeting the applicable requirements of WAC 296-304-05003 or a Jacob's ladder properly secured, meeting the requirements of WAC 296-304-05007(4).

[Order 76-7, § 296-304-05001, filed 3/1/76; Order 74-25, § 296-304-05001, filed 5/7/74.]

WAC 296-304-05003 Ladders. (1) General requirements.

(a) The use of ladders with broken or missing rungs or steps, broken or split side rails, or other faulty or defective construction is prohibited. When ladders with such defects are discovered, they shall be immediately withdrawn from service. Inspection of metal ladders shall include checking for corrosion of interiors of open end, hollow rungs.

(b) When sections of ladders are spliced, the ends shall be abutted, and not fewer than 2 cleats shall be securely nailed or bolted to each rail. The combined cross sectional area of the cleats shall be not less than the cross sectional area of the side rail. The dimensions of side rails for their total length shall be those specified in (2) or (3) of this section.

(c) Portable ladders shall be lashed, blocked or otherwise secured to prevent their being displaced. The side rails of ladders used for access to any level shall extend not less than 36 inches above that level. When this is not practical, grab rails which will provide a secure grip for an employee moving to or from the point of access shall be installed.

(d) Portable metal ladders shall be of strength equivalent to that of wood ladders. Manufactured portable metal ladders provided by the employer shall be in accordance with the provisions of the United States of America Standard Safety Code for Portable Metal Ladders, A14.2.

(e) Portable metal ladders shall not be used near electrical conductors nor for electric arc welding operations.

(f) Manufactured portable wood ladders provided by the employer shall be in accordance with the provisions of the United States of America Standard Safety Code for Portable Wood Ladders, A14.1.

(2) Construction of portable wood cleated ladders up to 30 feet in length.

(a) Wood side rails shall be made from west coast hemlock, eastern spruce, Sitka spruce, or wood of equivalent strength. Material shall be seasoned, straight-grained wood, and free from shakes, checks, decay or other defects which will impair its strength. The use of low density woods is prohibited.

(b) Side rails shall be dressed on all sides, and kept free of splinters.

(c) All knots shall be sound and hard. The use of material containing loose knots is prohibited. Knots shall not appear on the narrow face of the rail and, when in the side face, shall be not more than 1/2 inch in diameter or within 1/2 inch of the edge of the rail or nearer than 3 inches to a tread or rung.

(d) Pitch pockets not exceeding 1/8 inch in width, 2 inches in length and 1/2 inch in depth are permissible in wood side rails, provided that not more than one such pocket appears in each 4 feet of length.

(e) The width between side rails at the base shall be not less than 11 1/2 inches for ladders 10 feet or less in length. For longer ladders this width shall be increased at least 1/4 inch for each additional 2 feet in length.

(f) Side rails shall be at least 1 5/8 x 3 5/8 inches in cross section.

(g) Cleats (meaning rungs rectangular in cross section with the wide dimension parallel to the rails) shall be of the material used for side rails, straight-grained and free from knots. Cleats shall be mortised into the edges of the side rails 1/2 inch, or filler blocks shall be used on the rails between the cleats. The cleats shall be secured to each rail with three 10d common wire nails or fastened with through bolts or other fasteners of equivalent strength. Cleats shall be uniformly spaced not more than 12 inches apart.

(h) Cleats 20 inches or less in length shall be at least 25/32 x 3 inches in cross section. Cleats over 20 inches but not more than 30 inches in length shall be at least 25/32 x 3 3/4 inches in cross section.

(3) Construction of portable wood cleated ladders from 30 to 60 feet in length.

(a) Ladders from 30 to 60 feet in length shall be in accordance with the specifications of (2) of this section with the following exceptions:

(i) Rails shall be of not less than 2 x 6 inch lumber.

(ii) Cleats shall be of not less than 1 x 4 inch lumber.

(iii) Cleats shall be nailed to each rail with five 10d common wire nails or fastened with through bolts or other fastenings of equivalent strength.

[Order 74-25, § 296-304-05003, filed 5/7/74.]

WAC 296-304-05005 Guarding of deck openings and edges. (1) When employees are working in the vicinity of flush manholes and other small openings of comparable size in the deck and other working surfaces, such openings shall be suitably covered or guarded to a height of not less than 30 inches, except where the use of such guards is made impracticable by the work actually in progress.

(2) When employees are working around open hatches not protected by coamings to a height of 24 inches or around other large openings, the edge of the opening shall be

guarded in the working area to a height of 36 to 42 inches, except where the use of such guards is made impracticable by the work actually in progress.

(3) When employees are exposed to unguarded edges of decks, platforms, flats, and similar flat surfaces, more than 5 feet above a solid surface, the edges shall be guarded by adequate guardrails meeting the requirements of WAC 296-304-05001 (1)(a) and (b), unless the nature of the work in progress or the physical conditions prohibit the use or installation of such guardrails.

(4) When employees are working near the unguarded edges of decks of vessels afloat, they shall be protected by buoyant work vests, meeting the requirements of WAC 296-304-09007(1).

(5) Sections of bilges from which floor plates or gratings have been removed shall be guarded by guardrails except where they would interfere with work in progress. If these open sections are in a walkway at least two 10-inch planks placed side by side, or equivalent, shall be laid across the opening to provide a safe walking surface.

(6) Gratings, walkways, and catwalks, from which sections or ladders have been removed, shall be barricaded with adequate guardrails.

[Order 74-25, § 296-304-05005, filed 5/7/74.]

WAC 296-304-05007 Access to vessels. "Barge" - An unpowered, flat bottom, shallow draft vessel including scows, carfloats and lighters, but not ship-shaped or deep-draft barges.

"River towboat" - A shallow draft, low free board, self-propelled vessel designed to tow river barges by pushing ahead.

(1) Access to vessels afloat. The employer shall not permit employees to board or leave any vessel, except a barge or river towboat, until the following requirements have been met:

(a) Whenever practicable, a gangway of not less than 20 inches walking surface, of adequate strength, maintained in safe repair and safely secured shall be used. If a gangway is not practicable, a substantial straight ladder, extending at least 36 inches above the upper landing surface and adequately secured against shifting or slipping shall be provided. When conditions are such that neither a gangway nor a straight ladder can be used, a Jacob's ladder meeting the requirements of (4)(a) and (b) of this section may be used.

(b) Each side of such gangway, and the turntable if used, shall have a railing with a minimum height of approximately 33 inches measured perpendicularly from rail to walking surface at the stanchion, with a midrail. Rails shall be of wood, pipe, chain, wire or rope and shall be kept taut at all times.

(c) Gangways on vessels inspected and certificated by the U.S. Coast Guard are deemed to meet the foregoing requirements, except in cases where the vessel's regular gangway is not being used.

(d) The gangway shall be kept properly trimmed at all times.

(e) When a fixed tread accommodation ladder is used, and the angle is low enough to require employees to walk on the edge of the treads, cleated duckboards shall be laid over and secured to the ladder.

(f) When the lower end of a gangway overhangs the water between the ship and the dock in such a manner that there is danger of employees falling between the ship and the dock, a net or other suitable protection shall be rigged at the foot of the gangway in such a manner as to prevent employees from falling from the end of the gangway.

(g) If the foot of the gangway is more than one foot away from the edge of the apron, the space between them shall be bridged by a firm walkway equipped with railings, with a minimum height of approximately 33 inches with midrails on both sides.

(h) Supporting bridles shall be kept clear so as to permit unobstructed passage for employees using the gangway.

(i) When the upper end of the means of access rests on or flush with the top of the bulwark, substantial steps properly secured and equipped with at least one substantial handrail approximately 33 inches in height shall be provided between the top of the bulwark and the deck.

(j) Obstructions shall not be laid on or across the gangway.

(k) The means of access shall be adequately illuminated for its full length.

(l) Unless the construction of the vessel makes it impossible, the means of access shall be so located that drafts of cargo do not pass over it. In any event loads shall not be passed over the means of access while employees are on it.

(2) Access to vessels in drydock or between vessels. Gangways meeting the requirements of (1)(a), (b), (i), (j) and (l) of this section shall be provided for access from wing wall to vessel or, when two or more vessels, other than barges or river towboats, are lying abreast, from one vessel to another.

(3) Access to barges and river towboats.

(a) Ramps for access of vehicles to or between barges shall be of adequate strength, provided with side boards, well maintained and properly secured.

(b) Unless employees can step safely to or from the wharf, float, barge, or river towboat, either a ramp in accordance with the requirements of (a) of this section or a safe walkway in accordance with the requirements of (1)(g) of this section shall be provided. When a walkway is impracticable, a substantial straight ladder, extending at least 36 inches above the upper landing surface and adequately secured against shifting or slipping shall be provided. When conditions are such that neither a walkway nor a straight ladder can be used, a Jacob's ladder in accordance with the requirements of (4) of this section may be used.

(c) The means of access shall be in accordance with the requirements of (1)(i), (j) and (k) of this section.

(4) Jacob's ladders.

(a) Jacob's ladders shall be of the double rung or flat tread type. They shall be well maintained and properly secured.

(b) A Jacob's ladder shall either hang without slack from its lashings or be pulled up entirely.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-05007, filed 12/26/97, effective 3/1/98; Order 74-25, § 296-304-05007, filed 5/7/74.]

WAC 296-304-05009 Access to and guarding of dry docks and marine railings. (1) A gangway, ramp or permanent stairway of not less than 20 inches walking surface, of

adequate strength, maintained in safe repair and securely fastened, shall be provided between a floating dry dock and the pier or bulkhead.

(2) Each side of such gangway, ramp or permanent stairway, including those which are used for access to wing walls from dry dock floors, shall have a railing with a midrail. Such railings on gangways or ramps shall be approximately 42 inches in height; and railings on permanent stairways shall be not less than approximately 30 or more than approximately 34 inches in height. Rails shall be of wood, pipe, chain, wire, or rope and shall be kept taut at all times.

(3) Railings meeting the requirements of (2) of this section shall be provided on the means of access to and from the floors of graving docks.

(4) Railings approximately 42 inches in height, with a mid rail, shall be provided on the edges of wing walls of floating dry docks and on the edges of graving docks. Sections of the railings may be temporarily removed where necessary to permit line handling while a vessel is entering or leaving the dock.

(5) When employees are working on the floor of a floating dry dock where they are exposed to the hazard of falling into the water, the end of the dry dock shall be equipped with portable stanchions and 42 inch railings with a midrail. When such a railing would be impracticable or ineffective, other effective means shall be provided to prevent men from falling into the water.

(6) Access to wingwalls from floors of dry docks shall be by ramps, permanent stairways or ladders meeting the applicable requirements of WAC 296-304-05003.

(7) Catwalks on stiles of marine railways shall be no less than 20 inches wide and shall have on at least one side a guardrail and midrail meeting the requirements of WAC 296-304-05001 (9)(a) and (b).

[Order 74-25, § 296-304-05009, filed 5/7/74.]

WAC 296-304-05011 Access to cargo spaces and confined spaces. (1) Cargo spaces.

(a) There shall be at least one safe and accessible ladder in any cargo space which employees must enter.

(b) When any fixed ladder is visibly unsafe, the employer shall prohibit its use by employees.

(c) Straight ladders of adequate strength and suitably secured against shifting or slipping shall be provided as necessary when fixed ladders in cargo spaces do not meet the requirements of (a) of this section. When conditions are such that a straight ladder cannot be used, a Jacob's ladder meeting the requirements of WAC 296-304-05007(4) may be used.

(d) When cargo is stowed within 4 inches of the back of ladder rungs, the ladder shall be deemed "unsafe" for the purpose of this section.

(e) Fixed ladders or straight ladders provided for access to cargo spaces shall not be used at the same time that cargo drafts or other loads are entering or leaving the hold. Before using these ladders to enter or leave the hold, the employee shall be required to inform the winchman or crane signalman of his intention.

(2) Confined spaces.

(a) More than one means of access shall be provided to a confined space in which employees are working and in which

the work may generate a hazardous atmosphere in the space except where the structure or arrangement of the vessel makes this provision impractical.

(b) When the ventilation ducts required by these regulations must pass through these means of access, the ducts shall be of such a type and so arranged as to permit free passage of an employee through at least two of these means of access.

[Order 74-25, § 296-304-05011, filed 5/7/74.]

WAC 296-304-05013 Working surfaces. (1) When firebox floors present tripping hazards of exposed tubing or of missing or removed refractory, sufficient planking to afford safe footing shall be laid while work is being carried on within the boiler.

(2) The employer must provide and ensure the use of fall protection when employees work aloft or elsewhere at elevations more than 5 feet above a solid surface.

(a) Employees must be protected by the use of scaffolds, ladders, or personal protection equipment according to WAC 296-304-09021, or 296-304-09023.

(b) Employees must work from scaffolds when visually restricted by:

- Blasting hoods;
- Welding helmets; and
- Burning goggles; except
- For the initial and final welding or burning operation to start or complete a job such as the erection and dismantling of hung scaffolding; or
- Other similar, nonrepetitive jobs of brief duration.

(3) For work performed in restricted quarters, such as behind boilers and in between congested machinery units and piping, work platforms at least 20 inches wide meeting the requirements of WAC 296-304-05001 (8)(b) shall be used. Backrails may be omitted if bulkheading, boilers, machinery units, or piping afford proper protection against falling.

(4) When employees are boarding, leaving, or working from small boats or floats, they shall be protected by personal flotation devices meeting the requirements of WAC 296-304-09007(1).

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060, 98-02-006, § 296-304-05013, filed 12/26/97, effective 3/1/98; Order 76-7, § 296-304-05013, filed 3/1/76; Order 74-25, § 296-304-05013, filed 5/7/74.]

WAC 296-304-060 General working conditions—Scope and application. All sections of this chapter which include WAC 296-304-060 in the section number apply to general working conditions.

[Order 74-25, § 296-304-060, filed 5/7/74.]

WAC 296-304-06001 Housekeeping. (1) Good housekeeping conditions shall be maintained at all times. Adequate aisles and passageways shall be maintained in all work areas. All staging platforms, ramps, stairways, walkways, aisles, and passageways on vessels or dry docks shall be kept clear of all tools, materials, and equipment except that which is in use, and all debris such as welding rod tips, bolts, nuts, and similar material. Hose and electric conductors shall be elevated over or placed under the walkway or working surfaces or covered by adequate crossover planks.

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(2) All working areas on vessels and dry docks shall be kept reasonably free of debris, and construction material shall be so piled as not to present a hazard to employees.

(3) Slippery conditions on walkways or working surfaces shall be eliminated as they occur.

(4) Free access shall be maintained at all times to all exits and to all fire-alarm boxes or fire-extinguishing equipment.

(5) All oils, paints, thinners, solvents waste, rags, or other flammable substances shall be kept in fire resistant covered containers when not in use.

[Order 74-25, § 296-304-06001, filed 5/7/74.]

WAC 296-304-06003 Illumination. (1) All means of access and walkways leading to working areas as well as the working areas themselves shall be adequately illuminated.

(2) Temporary lights shall meet the following requirements:

(a) Temporary lights shall be equipped with guards to prevent accidental contact with the bulb, except that guards are not required when the construction of the reflector is such that the bulb is deeply recessed.

(b) Temporary lights shall be equipped with heavy duty electric cords with connections and insulation maintained in safe condition. Temporary lights shall not be suspended by their electric cords unless cords and lights are designed for this means of suspension. Splices which have insulation equal to that of the cable are permitted.

(c) Cords shall be kept clear of working spaces and walkways or other locations in which they are readily exposed to damage.

(3) Exposed noncurrent-carrying metal parts of temporary lights furnished by the employer shall be grounded either through a third wire in the cable containing the circuit conductors or through a separate wire which is grounded at the source of the current. Grounding shall be in accordance with the requirements of WAC 296-304-08003(2).

(4) Where temporary lighting from sources outside the vessel is the only means of illumination, portable emergency lighting equipment shall be available to provide illumination for safe movement of employees.

(5) Employees shall not be permitted to enter dark spaces without a suitable portable light. The use of matches and open flame lights is prohibited. In nongas free spaces, portable lights shall meet the requirements of WAC 296-304-02005(2).

(6) Temporary lighting stringers or streamers shall be so arranged as to avoid overloading of branch circuits. Each branch circuit shall be equipped with overcurrent protection of capacity not exceeding the rated current carrying capacity of the cord used.

[Order 74-25, § 296-304-06003, filed 5/7/74.]

WAC 296-304-06005 Utilities. (1) Steam supply and hoses.

(a) Prior to supplying a vessel with steam from a source outside the vessel, the employer shall ascertain from responsible vessel's representatives, having knowledge of the condition of the plant, the safe working pressure of the vessel's steam system. The employer shall install a pressure gauge and a relief valve of proper size and capacity at the point

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where the temporary steam hose joins the vessel's steam piping system or systems. The relief valve shall be set and capable of relieving at a pressure not exceeding the safe working pressure of the vessel's system in its present condition, and there shall be no means of isolating the relief valve from the system which it protects. The pressure gauge and relief valve shall be located so as to be visible and readily accessible.

(b) Steam hose and fittings shall have a safety factor of not less than five.

(c) When steam hose is hung in a bight or bights, the weight shall be relieved by appropriate lines. The hose shall be protected against chafing.

(d) Steam hose shall be protected from damage and hose and temporary piping shall be so shielded where passing through normal work areas as to prevent accidental contact by employees.

(2) Electric power.

(a) When the vessel is supplied with electric power from a source outside the vessel, the following precautions shall be taken prior to energizing the vessel's circuits:

(i) If in dry dock, the vessel shall be adequately grounded.

(ii) The employer shall ascertain from responsible vessel's representatives, having a knowledge of the condition of the vessel's electrical system, that all circuits to be energized are in a safe condition.

(iii) All circuits to be energized shall be equipped with overcurrent protection of capacity not exceeding the rated current carrying capacity of the cord used.

(3) Infrared electrical heat lamps.

(a) All infrared electrical heat lamps shall be equipped with guards that surround the lamps with the exception of the face, to minimize accidental contact with the lamps.

[Order 74-25, § 296-304-06005, filed 5/7/74.]

WAC 296-304-06007 Work in confined or isolated spaces. When any work is performed in a confined space, except as provided in WAC 296-304-04001 (2)(c), or when an employee is working alone in an isolated location, frequent checks shall be made to ensure the safety of the employees.

[Order 74-25, § 296-304-06007, filed 5/7/74.]

WAC 296-304-06009 Work on or in the vicinity of radar and radio. (1) No employees other than radar or radio repairmen shall be permitted to work on masts, king posts or other aloft areas unless the radar and radio are secured or otherwise made incapable of radiation. In either event, the radio and radar shall be appropriately tagged.

(2) Testing of radar or radio shall not be done until the employer can schedule such tests at a time when no work is in progress aloft or personnel can be cleared from the danger area according to minimum safe distances established for and based on the type, model, and power of the equipment.

[Order 74-25, § 296-304-06009, filed 5/7/74.]

WAC 296-304-06011 Work in or on lifeboats. (1) Before employees are permitted to work in or on a lifeboat, either stowed or in a suspended position, the employer shall ensure that the boat is secured independently of the releasing

gear to prevent the boat from falling due to accidental tripping of the releasing gear and movement of the davits or capsizing of a boat in chocks.

(2) Employees shall not be permitted to remain in boats while the boats are being hoisted into final stowed position.

(3) Employees shall not be permitted to work on the outboard side of lifeboats stowed on their chocks unless the boats are secured by gripes or otherwise secured to prevent them from swinging outboard.

[Order 74-25, § 296-304-06011, filed 5/7/74.]

WAC 296-304-06013 Health and sanitation. "Hazardous material" - A material with one or more of the following characteristics:

- Has a flash point below 140°F, closed cup, or is subject to spontaneous heating;

- Has a threshold limit value below 500 p.p.m. in the case of a gas or vapor, below 500 mg./m.³ for fumes, and below 25 m.p.p.c.f. in case of a dust;

- Has a single dose oral LD50 below 500 mg./kg.;

- Is subject to polymerization with the release of large amounts of energy;

- Is a strong oxidizing or reducing agent;

- Causes first degree burns to skin in short time exposure, or is systematically toxic by skin contact; or

- In the course of normal operations, may produce dusts, gases, fumes, vapors, mists, or smokes that have one or more of the above characteristics.

(1) No chemical product, such as a solvent or preservative; no structural material, such as cadmium or zinc coated steel, or plastic material; and no process material, such as welding filler metal; which is a hazardous material may be used until the employer has ascertained the potential fire, toxic, or reactivity hazards which are likely to be encountered in the handling, application, or utilization of such a material.

(2) In order to ascertain the hazards, as required by subsection (1) of this section, the employer shall obtain the following items of information which are applicable to a specific product or material to be used:

(a) The name, address, and telephone number of the source of the information specified in this section preferably those of the manufacturer of the product or material.

(b) The trade name and synonyms for a mixture of chemicals, a basic structural material, or for a process material; and the chemical name and synonyms, chemical family, and formula for a single chemical.

(c) Chemical names of hazardous ingredients, including, but not limited to, those in mixtures, such as those in: (i) Paints, preservatives, and solvents; (ii) alloys, metallic coatings, filler metals and their coatings or core fluxes; and (iii) other liquids, solids, or gases (e.g., abrasive materials).

(d) An indication of the percentage, by weight or volume, which each ingredient of a mixture bears to the whole mixture, and of the threshold limit value of each ingredient, in appropriate units.

(e) Physical data about a single chemical or a mixture of chemicals, including boiling point, in degrees Fahrenheit; vapor pressure, in millimeters of mercury; vapor density of gas or vapor (air=1); solubility in water, in percent by weight; specific gravity of material (water=1); percentage volatile, by

volume, at 70°F.; evaporation rate for liquids (either butyl acetate or ether may be taken as 1); and appearance and odor.

(f) Fire and explosion hazard data about a single chemical or a mixture of chemicals, including flashpoint, in degrees Fahrenheit; flammable limits, in percent by volume in air; suitable extinguishing media or agents; special fire fighting procedures; and unusual fire and explosion hazard information.

(g) Health hazard data, including threshold limit value, in appropriate units, for a single hazardous chemical or for the individual hazardous ingredients of a mixture as appropriate, effects of overexposure; and emergency and first aid procedures.

(h) Reactivity data, including stability, incompatibility, hazardous decomposition products, and hazardous polymerization.

(i) Procedures to be followed and precautions to be taken in cleaning up and disposing of materials leaked or spilled.

(j) Special protection information, including use of personal protective equipment, such as respirators, eye protection, and protective clothing, and of ventilation, such as local exhaust, general, special, or other types.

(k) Special precautionary information about handling and storing.

(l) Any other general precautionary information.

(3) The pertinent information required by subsection (2) of this section shall be recorded either on United States Department of Labor Form LSB 00S-4, Material Safety Data Sheet, or on an essentially similar form which has been approved by the department of labor and industries. Copies of Form LSB 00S-4 may be obtained at any of the following regional offices of the occupational safety and health administration:

(a) Pacific region. (Arizona, California, Hawaii, and Nevada.)

10353 Federal Building, 450 Golden Gate Avenue, Box 36017, San Francisco, Calif. 94102.

(b) Region X, OSHA, (Alaska, Washington, Idaho, and Oregon), Federal Office Building, 909 First Avenue, Seattle, Washington 98174.

A completed MSDS form shall be preserved and available for inspection for each hazardous chemical on the work-site.

(4) The employer shall instruct employees who will be exposed to the hazardous materials as to the nature of the hazards and the means of avoiding them.

(5) The employer shall provide all necessary controls, and the employees shall be protected by suitable personal protective equipment against the hazards identified under subsection (1) of this section and those hazards for which specific precautions are required in WAC 296-304-020 through 296-304-04013.

(6) The employer shall provide adequate washing facilities for employees engaged in the application of paints or coatings or in other operations where contaminants can, by ingestion or absorption, be detrimental to the health of the employees. The employer shall encourage good personal hygiene practices by informing the employees of the need for removing surface contaminants by thorough washing of hands and face prior to eating or smoking.

(7) The employer shall not permit eating or smoking in areas undergoing surface preparation or preservation or where shiprepairing, shipbuilding, or shipbreaking operations produce atmospheric contamination.

(8) The employer shall not permit employees to work in the immediate vicinity of uncovered garbage and shall ensure that employees working beneath or on the outboard side of a vessel are not subject to contamination by drainage or waste from overboard discharges.

(9) Requirements of chapter 296-62 WAC, Part C, hazard communication, will apply to shiprepairing, shipbuilding, and shipbreaking when potential hazards of chemicals and communicating information concerning hazards and appropriate protective equipment is applicable to an operation.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-06013, filed 12/26/97, effective 3/1/98. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-06013, filed 1/18/95, effective 3/10/95; 88-14-108 (Order 88-11), § 296-304-06013, filed 7/6/88; Order 76-7, § 296-304-06013, filed 3/1/76; Order 74-25, § 296-304-06013, filed 5/7/74.]

WAC 296-304-06015 First aid. (1) Unless a first-aid room and a qualified attendant are close at hand and prepared to render first aid to employees on behalf of the employer, the employer shall furnish a first-aid kit for each vessel on which work is being performed, except that when work is being performed on more than one small vessel at one pier, only one kit shall be required. The kit, when required, shall be kept close to the vessel and at least one employee, close, at hand, shall be qualified to administer first aid to the injured.

(2) The first-aid kit shall consist of a weatherproof container with individual sealed packages for each type of item. The contents of such kit shall contain a sufficient quantity of at least the following types of items:

Gauze roller bandages, 1 inch and 2 inch.

Gauze compress bandages, 4 inch.

Adhesive bandages, 1 inch.

Triangular bandage, 40 inch.

Ammonia inhalants and ampules.

Antiseptic applicators or swabs.

Burn dressing.

Eye dressing.

Wire or thin board splints.

Forceps and tourniquet.

(3) The contents of the first-aid kit shall be checked before being sent out on each job and at least weekly on each job to ensure that the expended items are replaced.

(4) There shall be available for each vessel on which ten or more employees are working one Stokes basket stretcher, or equivalent, permanently equipped with bridles for attaching to the hoisting gear, except that no more than two stretchers are required on each job location. A blanket or other liner suitable for transferring the patient to and from the stretcher shall be provided. Stretchers shall be kept close to the vessels. This section does not apply where ambulance services which are available are known to carry such stretchers.

[Order 74-25, § 296-304-06015, filed 5/7/74.]

WAC 296-304-070 Gear and equipment for rigging and materials handling—Scope and application. All sec-

tions of this chapter which include WAC 296-304-070 in the section number apply to gear and equipment for rigging and materials handling.

[Order 74-25, § 296-304-070, filed 5/7/74.]

WAC 296-304-07001 Inspection. (1) All gear and equipment provided by the employer for rigging and materials handling shall be inspected before each shift and, when necessary, at intervals during its use to ensure that is safe. Defective gear shall be removed and repaired or replaced before further use.

(2) The safe working load of gear as specified in WAC 296-304-07003 and 296-304-07005 shall not be exceeded.

[Order 74-25, § 296-304-07001, filed 5/7/74.]

WAC 296-304-07003 Ropes, chains and slings. (1) Manila rope and manila rope slings.

(a) Table G-1 in WAC 296-304-07011 shall be used to determine the safe working load of various sizes of manila rope and manila rope slings at various angles, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products: *Provided*, That a safety factor of not less than five is maintained.

(2) Wire rope and wire rope slings.

(a) Tables G-2 through G-5 in WAC 296-304-07011 shall be used to determine the safe working loads of various sizes and classifications of improved plow steel wire rope and wire rope slings with various types of terminals. For sizes, classifications and grades not included in these tables, the safe working load recommended by the manufacturer for specific, identifiable products shall be followed: *Provided*, That a safety factor of not less than five is maintained.

(b) Protruding ends of strands in splices on slings and bridles shall be covered or blunted.

(c) Where U-bolt wire rope clips are used to form eyes, Table G-6 in WAC 296-304-07011 shall be used to determine the number and spacing of clips. The U-bolt shall be applied so that the "U" section is in contact with the dead end of the rope.

(d) Wire rope shall not be secured by knots.

(3) Chains and chain slings.

(a) Tables G-7 and G-8 in WAC 296-304-07011 shall be used to determine the working load limit of various sizes of wrought iron and alloy steel chains and chain slings, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products.

(b) All sling chains, including end fastenings, shall be given a visual inspection before being used on the job. A thorough inspection of all chains in use shall be made every 3 months. Each chain shall bear an indication of the month in which it was thoroughly inspected. The thorough inspection shall include inspection for wear, defective welds, deformation and increase in length or stretch.

(c) Interlink wear, not accompanied by stretch in excess of 5 percent, shall be noted and the chain removed from service when maximum allowable wear at any point of link, as indicated in Table G-9 in WAC 296-304-07011 has been reached.

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(d) Chain slings shall be removed from service when, due to stretch, the increase in length of a measured section exceeds five percent; when a link is bent, twisted or otherwise damaged; or when raised scarfs or defective welds appear.

(e) All repairs to chains shall be made under qualified supervision. Links or portions of the chain found to be defective as described in (d) of this section shall be replaced by links having proper dimensions and made of material similar to that of the chain. Before repaired chains are returned to service, they shall be proof tested to the proof test load recommended by the manufacturer.

(f) Wrought iron chains in constant use shall be annealed or normalized at intervals not exceeding six months when recommended by the manufacturer. The chain manufacturer shall be consulted for recommended procedures for annealing or normalizing. Alloy chains shall never be annealed.

(g) A load shall not be lifted with a chain having a kink or knot in it. A chain shall not be shortened by bolting, wiring or knotting.

[Order 76-7, § 296-304-07003, filed 3/1/76; Order 74-25, § 296-304-07003, filed 5/7/74.]

WAC 296-304-07005 Shackles and hooks. (1) Shackles.

(a) Table G-10 in WAC 296-304-07011 shall be used to determine the safe working loads of various sizes of shackles, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products: *Provided*, That a safety factor of not less than five is maintained.

(2) Hooks.

(a) The manufacturer's recommendations shall be followed in determining the safe working loads of the various sizes and types of specific and identifiable hooks. All hooks for which no applicable manufacturer's recommendations are available shall be tested to twice the intended safe working load before they are initially put into use. The employer shall maintain a record of the dates and results of such tests.

(b) Loads shall be applied to the throat of the hook since loading the point overstresses and bends or springs the hook.

(c) Hooks shall be inspected periodically to see that they have not been bent by overloading. Bent or sprung hooks shall not be used.

[Order 76-7, § 296-304-07005, filed 3/1/76; Order 74-25, § 296-304-07005, filed 5/7/74.]

WAC 296-304-07007 Chain falls and pull-lifts. (1) Chain falls and pull-lifts shall be clearly marked to show the capacity and the capacity shall not be exceeded.

(2) Chain falls shall be regularly inspected to ensure that they are safe, particular attention being given to the lift chain, pinion, sheaves and hooks for distortion and wear. Pull-lifts shall be regularly inspected to ensure that they are safe, particular attention being given to the ratchet, pawl, chain and hooks for distortion and wear.

(3) Straps, shackles, and the beam or overhead structure to which a chain fall or pull-lift is secured shall be of adequate strength to support the weight of load plus gear. The

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upper hook shall be moused or otherwise secured against coming free of its support.

(4) Scaffolding shall not be used as a point of attachment for lifting devices, such as tackles, chain falls, and pull-lifts unless the scaffolding is specifically designed for that purpose.

[Order 74-25, § 296-304-07007, filed 5/7/74.]

WAC 296-304-07009 Hoisting and hauling equipment. (1) Derrick and crane certification:

(a) Derricks and cranes which are part of, or regularly placed aboard barges, other vessels, or on wingwalls of floating drydocks, and are used to transfer materials or equipment from or to a vessel or drydock, shall be tested and certificated in accordance with the standards provided in WAC 296-304-130 gear certification, by persons accredited for that purpose.

(b)(a) of this section shall take effect 180 days after the effective date of the amendment.

(2) The moving parts of hoisting and hauling equipment shall be guarded.

(3) Mobile crawler or truck cranes used on a vessel:

(a) The maximum manufacturer's rated safe working loads for the various working radii of the boom and the maximum and minimum radii at which the boom may be safely used with and without outriggers shall be conspicuously posted near the controls and shall be visible to the operator. A radius indicator shall be provided.

(b) The posted safe working loads of mobile crawler or truck cranes under the conditions of use shall not be exceeded.

(4) Accessible areas within the swing radius of the outermost part of the body of a revolving derrick or crane either permanently or temporarily mounted, shall be guarded in such a manner as to prevent an employee from being in such a position as to be struck by the crane or caught between the crane and fixed parts of the vessel or of the crane itself.

(5) Marine railways:

(a) The cradle or carriage on the marine railway shall be positively blocked or secured when in the hauled position to prevent it from being accidentally released.

[Order 74-25, § 296-304-07009, filed 5/7/74.]

WAC 296-304-07011 Use of gear. (1) Loads shall be safely rigged before being hoisted.

(2) Plates shall be handled on and off hulls by means of shackles whenever possible. Clips or pads of ample size shall be welded to the plate to receive the shackle pins whenever there are no holes in the plate. When it is not possible to make holes in or to weld pads to the plate, alligator tongs, grab hooks, grab clamps or screw clamps may be used. In such cases special precautions shall be taken to keep employees from under such lifts.

(3) Tag lines shall be provided on loads likely to swing or to need guidance.

(4) When slings are secured to eyebolts, the slings shall be so arranged, using spreaders if necessary, that the pull is within 20 degrees of the axis of the bolt.

(5) Slings shall be padded by means of wood blocks or other suitable material where they pass over sharp edges or corners of loads so as to prevent cutting or kinking.

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(6) Skips shall be rigged to be handled by not less than 3 legged bridles, and all legs shall always be used. When open end skips are used, means shall be taken to prevent the contents from falling.

(7) Loose ends of idle legs of slings in use shall be hung on the hook.

(8) Employees shall not be permitted to ride the hook or the load.

(9) Loads (tools, equipment or other materials) shall not be swung or suspended over the heads of employees.

(10) Pieces of equipment or structure susceptible to falling or dislodgement shall be secured or removed as early as possible.

(11) An individual who is familiar with the signal code in use shall be assigned to act as a signalman when the hoist operator cannot see the load being handled. Communications shall be made by means of clear and distinct visual or auditory signals except that verbal signals shall not be permitted.

(12) Pallets, when used, shall be of such material and construction and so maintained as to safely support and carry the loads being handled on them.

(13) A section of hatch through which materials or equipment are being raised, lowered, moved, or otherwise shifted manually or by a crane, winch, hoist, or derrick, shall be completely opened. The beam or pontoon left in place adjacent to an opening shall be sufficiently lashed, locked or otherwise secured to prevent it from being unshipped so that it cannot be displaced by accident.

(14) Hatches shall not be opened or closed while employees are in the square of the hatch below.

(15) Before loads or empty lifting gear are raised, lowered, or swung, clear and sufficient advance warning shall be given to employees in the vicinity of such operations.

(16) At no time shall an employee be permitted to place himself in hazardous position between a swinging load and a fixed object.

[Order 74-25, § 296-304-07011, filed 5/7/74.]

WAC 296-304-07013 Qualifications of operators. (1) When ship's gear is used to hoist materials aboard, a competent person shall determine that the gear is properly rigged, that it is in safe condition, and that it will not be overloaded by the size and weight of the lift.

(2) Only those employees who understand the signs, notices, and operating instructions, and are familiar with the signal code in use, shall be permitted to operate a crane, winch, or other power operated hoisting apparatus.

(3) No employee known to have defective uncorrected eyesight or hearing, or to be suffering from heart disease, epilepsy, or similar ailments which may suddenly incapacitate him, shall be permitted to operate a crane, winch or other power operated hoisting apparatus.

(4) No minor under eighteen years of age shall be employed in occupations involving the operation of any power-driven hoisting apparatus or assisting in such operations by work such as hooking on, loading slings, rigging gear, etc.

[Title 296 WAC—p. 2427]

TABLE E-1
DIMENSIONS AND SPACING OF WOOD
INDEPENDENT-POLE SCAFFOLD MEMBERS

Structural Members	Light duty (Up to 25 pounds per square foot)			Heavy duty (25 to 75 pounds per square foot)		
	Height in feet			Height in feet		
	24 or less	24-40	40-60	24 or less	24-40	40-60
Poles or uprights (in inches)	2x4	3x4 or 2x6	4x4	3x4	4x4	4x6
Bearers (in inches)	2x4	2x6	2x6	2x8	2x8	2x10
Ledgers (in inches)	2x6	2x6	2x6	2x8	2x8	2x8
Stringer (not supporting bearers) (in inches)	1x6	1x6	1x6	1x6	1x6	1x6
Braces (in inches)	1x4	1x6	1x6	1x6	1x6	1x6
Pole spacing—longitudinally (in feet)	7 1/2	7 1/2	7 1/2	7	7	7
Pole spacing—transversely (in feet)	6 1/2 min	7 1/2 min	8 1/2 min	6 1/2	10	10
Ledger spacing—vertically (in feet)	7	7	7	4 1/2	4 1/2	4 1/2

TABLE E-2
SPECIFICATIONS FOR SIDE RAILS OF LADDERS

Length (in feet)	Cross section (in inches)	
	At ends	At center
15	1 7/8 x 2 3/4	1 7/8 x 3 3/4
16	1 7/8 x 2 3/4	1 7/8 x 3 3/4
17	1 7/8 x 3	1 7/8 x 4
18	1 7/8 x 3	1 7/8 x 4
20	1 7/8 x 3	1 7/8 x 4 1/2
24	1 7/8 x 3	1 7/8 x 4 1/2

TABLE E-3
SPECIFICATIONS FOR THE CONSTRUCTION OF HORSES

Structural Members	Height in feet		
	Up to 10	10 to 16	16 to 20
Legs	Inches 2x4	Inches 3x4	Inches 4x6
Bearers or headers	2x6	2x8	4x6
Crossbraces	2x4	2x4	2x6
Longitudinal braces	or 1x8 2x4	2x6	2x6

TABLE E-4

SAFE CENTER LOADS FOR SCAFFOLD PLANK
OF 1,100 POUNDS FIBRE STRESS

[Codification note: The graphic presentation of this table has been varied in order that it would fall within the printing specifications for the Washington Administrative Code. The following table had lumber dimensions in the table heading typed in vertically across the page while the remainder of the table was typed horizontally on the page. The "Span in Feet" materials (6 through 16) which ran top to bottom has been switched to run left to right on the page. The "Lumber dimensions in inches" which ran left to right on the page has been switched to run top to bottom on the page.]

Lumber dimensions in inches	Span in Feet					
	6	8	10	12	14	16
A-2 x 10						
B-1 5/8 x 9 1/2	256	192	153	128	110	—
A-2 x 12						
B-1 5/8 x 11 1/2	309	232	186	155	133	116
A-3 x 8						
B-2 5/8 x 7 1/2	526	395	316	263	225	197
A-3 x 10						
B-2 5/8 x 9 1/2	667	600	400	333	286	250
A-3 x 12						
B-2 5/8 x 11 1/2	807	605	484	404	346	303

(A)—Rough lumber.
(B)—Dressed lumber.

TABLE G-1
MANILA ROPE
(in pounds or tons of 2000 pounds)

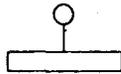
Circumference	Dia- meter in Inches	Single Leg	60°	45°	30°
					
3/4	1/4	120 lbs.	204 lbs.	170 lbs.	120 lbs.
1	5/16	200	346	282	200
1-1/8	3/8	270	467	380	270
1-1/4	7/16	350	605	493	350
1-3/8	15/32	450	775	635	450
1-1/2	1/2	530	915	798	530
1-3/4	9/16	690	1190	973	690
2	5/8	880	1520	1240	880
2-1/4	3/4	1080	1870	1520	1080
2-1/2	13/16	1300	2250	1830	1300
2-3/4	7/8	1540	2660	2170	1540
3	1	1800	3120	2540	1800
3-1/4	1-1/16	1.0 tons	1.7 tons	1.4 tons	1.0 tons
3-1/2	1-1/8	1.2	2.1	1.7	1.2
3-3/4	1-1/4	1.35	2.3	1.9	1.35
4	1-5/16	1.5	2.6	2.1	1.5
4-1/2	1-1/2	1.8	3.1	2.5	1.8
5	1-5/8	2.25	3.9	3.2	2.25
5-1/2	1-3/4	2.6	4.5	3.7	2.6
6	2	3.1	5.4	4.4	3.1
6-1/2	2-1/8	3.6	6.2	5.1	3.6

TABLE G-2
RATED CAPACITIES FOR IMPROVED PLOW
STEEL, INDEPENDENT WIRE ROPE CORE,
WIRE ROPE AND WIRE ROPE SLINGS
(in tons of 2000 pounds)

SINGLE LEG						
Rope Dia. Inches	Vertical			Choker		
	A	B	C	A	B	C
6X19 CLASSIFICATION						
1/4"	.59	.56	.53	.44	.42	.40
3/8"	1.3	1.2	1.1	.98	.93	.86
1/2"	2.3	2.2	2.0	1.7	1.6	1.5
5/8"	3.6	3.4	3.0	2.7	2.5	2.2
3/4"	5.1	4.9	4.2	3.8	3.6	3.1
7/8"	6.9	6.6	5.5	5.2	4.9	4.1
1"	9.0	8.5	7.2	6.7	6.4	5.4
1-1/8"	11.0	10.0	9.0	8.5	7.8	6.8
6X37 CLASSIFICATION						
1-1/4"	13.	12.	10.	9.9	9.2	7.9
1-3/8"	16.	15.	13.	12.	11.	9.6
1-1/2"	19.	17.	15.	14.	13.	11.
1-3/4"	26.	24.	20.	19.	18.	15.
2"	33.	30.	26.	25.	23.	20.
2-1/4"	41.	38.	33.	31.	29.	25.

- (A) - Socket or swaged terminal attachment.
- (B) - Mechanical sleeve attachment.
- (C) - Hand tucked splice attachment.

TABLE G-3
RATED CAPACITIES FOR
IMPROVED PLOW STEEL,
INDEPENDENT WIRE ROPE CORE,
WIRE ROPE SLINGS
(in tons of 2000 pounds)

[Codification note: The graphic presentation of this table has been varied slightly in order that it would fall within the printing specifications for the Washington Administrative Code. The following table was too wide to be accommodated in the width of the WAC column. The table as codified has been divided into two tables covering the "TWO—LEG BRIDLE OR BASKET HITCH" for 6x19 Classification and for 6x37 Classification. Part One has Rope Diameter in Inches for Vertical and 60° within the two classifications. Part Two has Rope Diameter in Inches for 45° and 30° within the two classifications.]

TWO - LEG BRIDLE OR BASKET HITCH
(TABLE G-3: Part 1—Vertical and 60° Positions)

Rope Dia. Inches	Vertical			60° 		
	A	B	C	A	B	C
6X19 CLASSIFICATION						
1/4"	1.2	1.1	1.0	1.0	.97	.92
3/8"	2.6	2.5	2.3	2.3	2.1	2.0
1/2"	4.6	4.4	3.9	4.0	3.8	3.4
5/8"	7.2	6.8	6.0	6.2	5.9	5.2
3/4"	10.	9.7	8.4	8.9	8.4	7.3

Rope Dia. Inches	Vertical			60° (illus.)		
	A	B	C	A	B	C
7/8"	14.	13.	11.	12.	11.	9.6
1"	18.	17.	14.	15.	15.	12.
1-1/8"	23.	21.	18.	19.	18.	16.

6X37 CLASSIFICATION

1-1/4"	26.	24.	21.	23.	21.	18.
1-3/8"	32.	29.	25.	28.	25.	22.
1-1/2"	38.	35.	30.	33.	30.	26.
1-3/4"	51.	47.	41.	44.	41.	35.
2"	66.	61.	53.	57.	53.	46.
2-1/4"	83.	76.	66.	72.	66.	57.

TWO - LEG BRIDLE OR BASKET HITCH
(TABLE G-3: Part 2—45° and 30° Positions)

Rope Dia. Inches	45° 			30° 		
	A	B	C	A	B	C

6X19 CLASSIFICATION

1/4"	.83	.79	.75	.59	.56	.53
3/8"	1.8	1.8	1.6	1.3	1.2	1.1
1/2"	3.2	3.1	2.8	2.3	2.2	2.0
5/8"	5.1	4.8	4.2	3.6	3.4	3.0
3/4"	7.2	6.9	5.9	5.1	4.9	4.2
7/8"	9.8	9.3	7.8	6.9	6.6	5.5
1"	13.	12.	10.	9.0	8.5	7.2
1-1/8"	16.	15.	13.	11.	10.	9.0

6X37 CLASSIFICATION

1-1/4"	19.	17.	15.	13.	12.	10.
1-3/8"	22.	21.	18.	16.	15.	13.
1-1/2"	27.	25.	21.	19.	17.	15.
1-3/4"	36.	33.	29.	26.	24.	20.
2"	47.	43.	37.	33.	30.	26.
2-1/4"	58.	54.	47.	41.	38.	33.

- (A) - Socket or swaged terminal attachment.
- (B) - Mechanical sleeve attachment.
- (C) - Hand tucked splice attachment.

TABLE G-4
RATED CAPACITIES FOR
IMPROVED PLOW STEEL,
FIBER CORE, WIRE ROPE AND
WIRE ROPE SLINGS
(in tons of 2000 pounds)

SINGLE LEG						
Rope Dia. Inches	Vertical			Choker		
	A	B	C	A	B	C
6X19 CLASSIFICATION						
1/4"	.55	.51	.49	.41	.38	.37
3/8"	1.2	1.1	1.1	.91	.85	.80

SINGLE LEG						
Rope Dia. Inches	Vertical			Choker		
	A	B	C	A	B	C
1/2	2.1	2.0	1.8	1.6	1.5	1.4
5/8	3.3	3.1	2.8	2.5	2.3	2.1
3/4	4.8	4.4	3.9	3.6	3.3	2.9
7/8	6.4	5.9	5.1	4.8	4.5	3.9
1	8.4	7.7	6.7	6.3	5.8	5.0
1-1/8	10.	9.5	8.4	7.9	7.1	6.3

6X37 CLASSIFICATION						
1-1/4	12.	11.	9.8	9.2	8.3	7.4
1-3/8	15.	13.	12.	11.	10.	8.9
1-1/2	17.	16.	14.	13.	12.	10.
1-3/4	24.	21.	19.	18.	16.	14.
2	31.	28.	25.	23.	21.	18.

- (A) - Socket or swaged terminal attachment.
- (B) - Mechanical sleeve attachment.
- (C) - Hand tucked splice attachment.

TABLE G-5
RATED CAPACITIES FOR IMPROVED PLOW STEEL, FIBER CORE, WIRE ROPE SLINGS
 (in tons of 2000 pounds)

[Codification note: The graphic presentation of this table has been varied slightly in order that it would fall within the printing specifications for the Washington Administrative Code. The following table was too wide to be accommodated in the width of the WAC column. The table as codified has been divided into two tables covering the "TWO - LEG BRIDLE OR BASKET HITCH" for 6x19 Classification and for 6x37 Classification. Part One has Rope Diameter in Inches for Vertical and 60° within the two classifications. Part Two has Rope Diameter in Inches for 45° and 30° within the two classifications.]

TWO - LEG BRIDLE OR BASKET HITCH (TABLE G-5: Part 1—Vertical and 60° Positions)						
Rope Dia. Inches	Vertical			60° 		
	A	B	C	A	B	C
6X19 CLASSIFICATION						
1/4	1.1	1.0	.99	.95	.88	.85
3/8	2.4	2.2	1.9	2.1	1.9	1.8
1/2	4.3	3.9	3.7	3.7	3.4	3.2
5/8	6.7	6.2	5.6	5.8	5.3	4.8
3/4	9.5	8.8	7.8	8.2	7.6	6.8
7/8	13.	12.	10.	11.	10.	8.9
1	17.	15.	13.	14.	13.	11.
1-1/8	21.	19.	17.	18.	16.	14.

6X37 CLASSIFICATION						
1-1/4	25.	22.	20.	21.	19.	17.
1-3/8	30.	27.	24.	26.	23.	20.
1-1/2	35.	23.	28.	30.	27.	24.
1-3/4	48.	43.	38.	41.	37.	33.
2	62.	55.	49.	53.	48.	43.

TWO - LEG BRIDLE OR BASKET HITCH (TABLE G-5: Part 2—45° and 30° Positions)						
Rope Dia. Inches	45° 			30° 		
	A	B	C	A	B	C
6X19 CLASSIFICATION						
1/4	.77	.72	.70	.55	.51	.49
3/8	1.7	1.6	1.5	1.2	1.1	1.1
1/2	3.0	2.8	2.6	2.1	2.0	1.8
5/8	4.7	4.4	4.0	3.3	3.1	2.8
3/4	6.7	6.2	5.5	4.8	4.4	3.9
7/8	9.1	8.4	7.3	6.4	5.9	5.1
1	12.	11.	9.4	8.4	7.7	6.7
1-1/8	15.	13.	12.	10.	9.5	8.4

6X37 CLASSIFICATION						
1-1/4	17.	16.	14.	12.	11.	9.8
1-3/8	21.	19.	17.	15.	13.	12.
1-1/2	25.	22.	20.	17.	16.	14.
1-3/4	34.	30.	27.	24.	21.	19.
2	43.	39.	35.	31.	28.	25.

- (A) - Socket or swaged terminal attachment.
- (B) - Mechanical sleeve attachment.
- (C) - Hand tucked splice attachment.

TABLE G-6
NUMBER AND SPACING OF U-BOLT WIRE ROPE CLIPS

Improved plow steel rope diameter inches	Number of Clips		Minimum spacing (inches)
	Drop forged	Other material	
*	
1/2	3	4	3
5/8	3	4	3 3/4
3/4	4	5	4 1/2
7/8	4	5	5 1/4
1	4	6	6
1 1/8	5	6	6 3/4
1 1/4	5	7	7 1/2
1 3/8	6	7	8 1/4
1 1/2	6	8	9

* Three clips shall be used on wire size less than 1/2-inch diameter.

TABLE G-7
WROUGHT IRON CHAIN
(in pounds or tons of 2000 pounds)

Nominal Size Chain Stock Inch	Single Leg	60°	45°	30°
* 1/4	1060	1835	1500	1060
* 5/16	1655	2865	2340	1655
3/8	2385	2.1	3370	2385
* 7/16	3250	2.8	2.3	3250
1/2	12.1	13.7	13.0	12.1
* 9/16	12.7	14.6	13.8	12.7
5/8	13.3	15.7	14.7	13.3
3/4	14.8	18.3	16.7	14.8
7/8	16.5	11.2	19.2	16.5
1	18.5	14.7	12.0	18.5
1- 1/8	10.0	17.3	14.2	10.0
1- 1/4	12.4	21.4	17.5	12.4
1- 3/8	15.0	25.9	21.1	15.0
1- 1/2	17.8	30.8	25.2	17.8
1- 5/8	20.9	36.2	29.5	20.9
1- 3/4	24.2	42.0	34.3	24.2
1- 7/8	27.6	47.9	39.1	27.6
2	31.6	54.8	44.8	31.6

*These sizes of wrought iron chain are no longer manufactured in the United States.

TABLE G-8
ALLOY STEEL CHAIN
(in tons of 2000 pounds)

Nominal Size Chain Stock Inch	Single Leg	60°	45°	30°
1/4	1.62	2.82	2.27	1.62
3/8	3.30	5.70	4.65	3.30
1/2	5.62	9.75	7.90	5.62
5/8	8.25	14.25	11.65	8.25
3/4	11.5	19.9	16.2	11.5
7/8	14.3	24.9	20.3	14.3
1	19.3	33.4	27.3	19.8
1-1/8	22.2	38.5	31.5	22.2
1-1/4	28.7	49.7	40.5	28.7
1-3/8	33.5	58.0	47.0	33.5
1-1/2	39.7	68.5	56.0	39.7
1-5/8	42.5	73.5	59.5	42.5
1-3/4	47.0	81.5	62.0	47.0

TABLE G-9
MAXIMUM ALLOWABLE WEAR AT ANY POINT OF LINK

Chain size in inches	Maximum allowable wear in fraction of inches
1/4 (9/32)	3/64
3/8	5/64
1/2	7/64
5/8	9/64

(1999 Ed.)

Chain size in inches

3/4	5/32
7/8	1 1/64
1	3/16
1 1/8	7/32
1 1/4	1/4
1 3/8	9/32
1 1/2	5/16
1 3/4	1 1/32

TABLE G-10
SAFE WORKING LOADS FOR SHACKLES
(in tons of 2,000 pounds)

Material size (inches)	Pin diameter (inches)	Safe working load
1/2	5/8	1.4
5/8	3/4	2.2
3/4	7/8	3.2
7/8	1	4.3
1	1 1/8	5.6
1 1/8	1 1/4	6.7
1 1/4	1 3/8	8.2
1 3/8	1 1/2	10.0
1 1/2	1 5/8	11.9
1 3/4	2	16.2
2	2 1/4	21.2

TABLE I-1A
FILTER LENSES FOR PROTECTION AGAINST RADIANT ENERGY

OPERATIONS	ELECTRODE SIZE 1/32 IN	ARC CURRENT	MINIMUM PROTECTIVE SHADE
Shielded metal arc welding	Less than 3	Less than 60	7
	3-5	60-160	8
	5-8	160-250	10
Gas metal arc welding and flux cored arc welding	More than 8	250-550	11
		Less than 60	7
		60-160	10
Gas Tungsten arc welding		160-250	10
		250-550	10
		Less than 50	8
Air carbon arc cutting	(Light)	50-150	8
	(Heavy)	150-500	10
		500-1000	11
Plasma arc welding		Less than 20	6
		20-100	8
		100-400	10
		400-800	11
Plasma arc cutting	(Light)**	Less than 300	8
	(Medium)**	300-400	9
	(Heavy)**	400-800	10
Torch brazing	—	—	3
Torch soldering	—	—	2
Carbon Arc welding	—	—	14

**These values apply where the actual arc is clearly seen. Lighter filters may be used when the arc is hidden by the workplace.

TABLE I-1B
FILTER LENSES FOR PROTECTION AGAINST
RADIANT ENERGY

OPERATIONS	PLATE THICKNESS... INCHES	PLATE THICKNESS... MM	MINIMUM* PROTECTIVE SHADE
Gas welding			
Light	Under 1/8	Under 3.2	4
Medium	1/8 - 1/2	3.2 - 12.7	5
Heavy	Over 1/2	Over 12.7	6
Oxygen cutting			
Light	Under 1	Under 25	3
Medium	1 - 6	25 - 100	4
Heavy	Over 6	Over 150	5

*As rule of thumb, start with a shade that is too dark to see the weld zone. Then go to a lighter shade which gives sufficient view of the weld zone without going below the minimum. In oxyfuel gas welding or cutting where the torch produces a high yellow light, it is desirable to use a filter lens that absorbs the yellow or sodium line in the viable light of the (spectrum) operation.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-07013, filed 12/26/97, effective 3/1/98; Order 74-25, § 296-304-07013, filed 5/7/74.]

WAC 296-304-080 Tools and related equipment—Scope and application. All sections of this chapter which include WAC 296-304-080 in the section number apply to tools and related equipment.

[Order 74-25, § 296-304-080, filed 5/7/74.]

WAC 296-304-08001 General precautions. (1) Hand lines, slings, tackles of adequate strength, or carriers such as tool bags with shoulder straps shall be provided and used to handle tools, materials, and equipment so that employees will have their hands free when using ship's ladders and access ladders. The use of hose or electric cords for this purpose is prohibited.

(2) When air tools of the reciprocating type are not in use, the discs and tools shall be removed.

(3) All portable, power-driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.

(4) The moving parts of machinery on dry docks shall be guarded.

(5) Before use, pneumatic tools shall be secured to the extension hose or whip by some positive means to prevent the tool from becoming accidentally disconnected from the whip.

(6) The moving parts of drive mechanisms, such as gearing and belting on large portable tools, shall be adequately guarded.

(7) Headers, manifolds, and widely spaced hose connections on compressed air lines shall bear the word "air" in letters at least 1 inch high, which shall be painted either on the manifold or separate hose connections, or on signs perma-

nently attached to the manifolds or connections. Grouped air connections may be marked in one location.

(8) Before use, compressed air hose shall be examined. Visibly damaged and unsafe hose shall not be used.

[Order 76-7, § 296-304-08001, filed 3/1/76; Order 74-25, § 296-304-08001, filed 5/7/74.]

WAC 296-304-08003 Portable electric tools. (1) The frames of portable electric tools and appliances, except double insulated tools approved by Underwriters' Laboratories, shall be grounded either through a third wire in the cable containing the circuit conductors or through a separate wire which is grounded at the source of the current.

(2) Grounding circuits, other than by means of the structure of the vessel on which the tool is being used, shall be checked to ensure that the circuit between the ground and the grounded power conductor has resistance which is low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

(3) Portable electric tools which are held in the hand shall be equipped with switches of a type which must be manually held in the closed position.

(4) Worn or frayed electric cables shall not be used.

(5) The employer shall notify the officer in charge of the vessel before using electric power tools operated with the vessel's current.

[Order 74-25, § 296-304-08003, filed 5/7/74.]

WAC 296-304-08005 Hand tools. (1) Employers shall not issue or permit the use of unsafe hand tools.

(2) Wrenches, including crescent, pipe, end and socket wrenches, shall not be used when jaws are sprung to the point that slippage occurs.

(3) Impact tools, such as drift pins, wedges, and chisels, shall be kept free of mushroomed heads.

(4) The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the tool.

[Order 74-25, § 296-304-08005, filed 5/7/74.]

WAC 296-304-08007 Abrasive wheels. (1) Floor stand and bench mounted abrasive wheels used for external grinding shall be provided with safety guards (protection hoods). The maximum angular exposure of the grinding wheel periphery and sides shall be not more than 90 degrees, except that when work requires contact with the wheel below the horizontal plane of the spindle, the angular exposure shall not exceed 125 degrees. In either case the exposure shall begin not more than 65 degrees above the horizontal plane of the spindle. Safety guards shall be strong enough to withstand the effect of a bursting wheel.

(2) Floor and bench mounted grinders shall be provided with work rests which are rigidly supported and readily adjustable. Such work rests shall be kept a distance not to exceed 1/8 inch from the surface of the wheel.

(3) Cup type wheels use for external grinding shall be protected by either a revolving cup guard or a band type guard in accordance with the provisions of the United States of American Standard Safety Code for the Use, Care, and Protection of Abrasive Wheels, B7.1.1970. All other portable abrasive wheels used for external grinding shall be provided

with safety guards (protection hoods) meeting the requirements of (5) of this section, except as follows:

(a) When the work location makes it impossible, in which case a wheel equipped with safety flanges as described in (6) of this section shall be used.

(b) When wheels 2 inches or less in diameter which are securely mounted on the end of a steel mandrel are used.

(4) Portable abrasive wheels used for internal grinding shall be provided with safety flanges (protection flanges) meeting the requirements of (6) of this section, except as follows:

(a) When wheels 2 inches or less in diameter which are securely mounted on the end of a steel mandrel are used.

(b) If the wheel is entirely within the work being ground while in use.

(5) When safety guards are required, they shall be so mounted as to maintain proper alignment with the wheel, and the guard and its fastenings shall be of sufficient strength to retain fragments of the wheel in case of accidental breakage. The maximum angular exposure of the grinding wheel periphery and sides shall not exceed 180 degrees.

(6) When safety flanges are required, they shall be used only with wheels designed to fit the flanges. Only safety flanges of a type and design and properly assembled so as to insure that the pieces of the wheel will be retained in case of accidental breakage shall be used.

(7) All abrasive wheels shall be closely inspected and ring tested before mounting to ensure that they are free from cracks or defects.

(8) Grinding wheels shall fit freely on the spindle and shall not be forced on. The spindle nut shall be tightened only enough to hold the wheel in place.

(9) The power supply shall be sufficient to maintain the rated spindle speed under all conditions of normal grinding. The rated maximum speed of the wheel shall not be exceeded.

(10) The employer must ensure that all employees using abrasive wheels are protected by eye protection equipment that meets the requirements of WAC 296-304-09005 (1) and (2), except when adequate eye protection is provided by eye shields permanently attached to the bench or floor stand.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-08007, filed 12/26/97, effective 3/1/98; Order 74-25, § 296-304-08007, filed 5/7/74.]

WAC 296-304-08009 Powder-actuated fastening tools. (1) The employer must ensure powder-actuated fastening tools are used, designed, constructed, and maintained according to the requirements of WAC 296-24-663, Safety requirements for powder-actuated fastening systems.

(2) The employer must ensure that employees using powder-actuated fastening tools are protected by personal protective equipment that meets the requirements of WAC 296-304-09005 (1) and (2). The employer must also meet the hearing conservation requirements of the general occupational health standards, chapter 296-62 WAC, Part K.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-08009, filed 12/26/97, effective 3/1/98. Statutory Authority: Chapter 49.17 RCW. 95-04-006, § 296-304-08009, filed 1/18/95, effective 3/10/95; Order 76-7, § 296-304-08009, filed 3/1/76; Order 74-25, § 296-304-08009, filed 5/7/74.]

(1999 Ed.)

WAC 296-304-08011 Internal combustion engines, other than ship's equipment. (1) When internal combustion engines, furnished by the employer are used in a fixed position below decks, for such purposes as driving pumps, generators, and blowers, the exhaust shall be led to the open air, clear of any ventilation intakes and openings through which it might enter the vessel

(2) All exhaust line joints and connections shall be checked for tightness immediately upon starting the engine, and any leaks shall be corrected at once.

(3) When internal combustion engines on vehicles, such as forklifts and mobile cranes, or on portable equipment such as fans, generators, and pumps exhaust into the atmosphere below decks, the competent person shall make tests of the carbon monoxide content of the atmosphere as frequently as conditions require to ensure that dangerous concentrations do not develop. Employees shall be removed from the compartment involved when the carbon monoxide concentration exceeds 50 parts per million (0.005%). The employer shall use blowers sufficient in size and number and so arranged as to maintain the concentration below this allowable limit before work is resumed.

[Order 74-25, § 296-304-08011, filed 5/7/74.]

WAC 296-304-090 Personal protective equipment (PPE)—General requirements. The employer must provide and ensure that each affected employee uses the appropriate personal protective equipment (PPE) for the eyes, face, head, extremities, torso, and respiratory system, including protective clothing, protective shields, hearing protection, protective barriers, personal fall protection equipment, and life saving equipment, wherever the employee is exposed to hazards that require the use of PPE. The employer must furnish the personal protective equipment at no cost to employees if:

- The intended purpose is to protect against hazardous materials (the PPE may be contaminated by hazardous materials in the course of employment); or
- The PPE is of such a nature that it would not reasonably be worn outside the worksite.

The provision of personal protective equipment which may reasonably be worn outside of the workplace is subject to labor-management negotiations, but the employer must ensure that exposed employees are wearing the appropriate PPE.

Examples of PPE that must be provided at no cost to employees include but are not limited to:

- Boots worn to protect against chemicals;
- Nonprescription protective eye wear;
- Goggles to fit over prescription eye wear;
- Metatarsal protection;
- Full body harnesses and lanyards.

Examples of PPE that provision is subject to labor-management negotiation include but are not limited to:

- Leather boots with or without steel toes;
- Coats to protect against inclement weather;
- Prescription protective eye wear (except as part of a full facepiece or hooded respirator).

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-090, filed 12/26/97, effective 3/1/98; Order 74-25, § 296-304-090, filed 5/7/74.]

[Title 296 WAC—p. 2433]

WAC 296-304-09001 Hazard assessment and equipment selection. (1) The employer must assess its work activity to determine if hazards that require the use of personal protective equipment (PPE) are present, or are likely to be present.

(a) If such hazards are present, or likely to be present, the employer must:

(i) Select, and require each affected employee to use, PPE that will protect the employee from the hazards identified in the hazard assessment;

(ii) Inform the affected employee what types of PPE to use;

(iii) Select PPE that properly fits the affected employee; and

(iv) Verify that the hazard assessment has been performed through a document that contains the following information:

- Work activity evaluated;
- Occupation;
- Date(s) of the hazard assessment; and
- The name of the person performing the hazard assessment.

Note: A hazard assessment conducted according to the trade or occupation of affected employees will be considered to comply with this requirement if it addresses all PPE - related hazards to which employees are exposed in the course of their work activities.

(2) The employer must ensure that employees do not use defective or damaged PPE.

(3) The employer must ensure that all unsanitary PPE, including all previously used PPE, is cleaned and disinfected before it is reissued.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09001, filed 12/26/97, effective 3/1/98; Order 76-7, § 296-304-09001, filed 3/1/76; Order 74-25, § 296-304-09001, filed 5/7/74.]

WAC 296-304-09003 Training. The employer must provide training to each employee for whom PPE is required by this section.

(1) Each employee whose work activities require the use of PPE must be trained to know at least the following:

- (a) When PPE is necessary;
- (b) What PPE is necessary;
- (c) How to properly put on, take off, adjust, and wear PPE;

(d) The limitations of the PPE; and

(e) The proper care, maintenance, useful life and disposal of the PPE.

(2) The employer must ensure that each affected employee demonstrates the ability to use PPE properly before being allowed to perform work where its use is required.

(3) The employer must retrain any employee who does not understand or display the skills required by subsection (2) of this section. Circumstances where retraining is required include, but are not limited to, situations where:

(a) Changes in occupation or work make previous training obsolete; or

(b) Changes in the types of PPE to be used make previous training obsolete; or

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(c) Inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the understanding or skill.

(4) The employer must verify that each affected employee has received the required training through a document that contains the following information:

- Name of each employee trained;
- Date(s) of training; and
- Type of training the employee received.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09003, filed 12/26/97, effective 3/1/98. Statutory Authority: Chapter 49.17 RCW. 93-19-142 (Order 93-04), § 296-304-09003, filed 9/22/93, effective 11/1/93. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-304-09003, filed 11/30/83; Order 74-25, § 296-304-09003, filed 5/7/74.]

WAC 296-304-09005 Eye and face protection. (1) The employer must provide each affected employee with eye and face protection according to the following requirements:

(a) Each affected employee must use appropriate eye or face protection when exposed to eye or face hazards caused by flying particles, molten metal, liquid chemicals, acid or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

(b) Each affected employee must use eye or face protection that provides side protection when there is a hazard from flying objects. A detachable side protector (e.g., a clip-on or slide-on side shield) that meets the requirements of this section is acceptable.

(c) Each affected employee who wears prescription lenses must:

• Use eye protection that incorporates the prescription in its design; or

• Be protected by eye protection that can be worn over prescription lenses without disturbing the proper position of either the PPE or the prescription lenses.

(d) Each affected employee must use equipment with filter lenses of a shade that provides appropriate protection from injurious light radiation. Tables I-1A and I-1B lists the appropriate shade numbers for various operations. If filter lenses are used in goggles worn under a helmet with a lens, the shade number of the lens in the helmet may be reduced so that the shade numbers of the two lenses will equal the value shown in the Tables I-1A and I-1B.

(2) The employer must ensure that all protective eye and face devices meet the following criteria:

(a) Protective eye and face devices purchased after February 20, 1995, comply with the American National Standards Institute, ANSI Z87.1-1989, "Practice for Occupational and Educational Eye and Face Protection," or the employer demonstrates that the devices are equally effective.

(b) Eye and face protective devices purchased before February 20, 1995, comply with "American National Standard Practice for Occupational and Educational Eye and Face Protection, Z87.1-1979," or the employer demonstrates that the devices are equally effective.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09005, filed 12/26/97, effective 3/1/98; Order 74-25, § 296-304-09005, filed 5/7/74.]

WAC 296-304-09007 Respiratory protection. The employer must provide respiratory protection that meets the requirements of the general occupational health standards, chapter 296-62 WAC, Part E.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09007, filed 12/26/97, effective 3/1/98; Order 76-7, § 296-304-09007, filed 3/1/76; Order 74-25, § 296-304-09007, filed 5/7/74.]

WAC 296-304-09009 Hearing protection. The employer must meet the hearing conservation requirements of the general occupational health standards, chapter 296-62 WAC, Part K.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09009, filed 12/26/97, effective 3/1/98.]

WAC 296-304-09011 Head protection. (1) The employer must provide each affected employee with head protection according to the following requirements:

(a) Each affected employee wears a protective helmet when working in areas where there is a potential for injury to the head.

(b) Each affected employee wears a protective helmet designed to reduce electrical shock hazards where there is potential for electric shock or burns from contact with exposed electrical conductors that could contact the head.

(2) The employer must ensure that all protective helmets meet the following criteria:

(a) Protective helmets purchased before February 20, 1995, comply with the "American National Standard Safety Requirements for Industrial Head Protection, Z89.1-1969," or the employer demonstrates that they are equally effective.

(b) Protective helmets purchased after February 20, 1995, comply with ANSI Z89.1-1986, "Personnel Protection—Protective Headwear for Industrial Workers—Requirements," or the employer demonstrates that they are equally effective.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09011, filed 12/26/97, effective 3/1/98.]

WAC 296-304-09013 Foot protection. (1) The employer must ensure that each affected employee wears protective footwear when working in areas where:

- There is a danger of foot injuries from falling or rolling objects;
- There is a danger of foot injuries from objects piercing the sole; or
- Where an employee's feet are exposed to electrical hazards.

(2) The employer must ensure that all protective footwear meets the following criteria:

(a) Protective footwear purchased before February 20, 1995, complies with the ANSI standard "USA Standard for Men's Safety-Toe Footwear," ANSI Z41-1983, or the employer demonstrates that footwear is equally effective.

(b) Protective footwear purchased after February 20, 1995, complies with ANSI Z41-1991, "American National Standard for Personal Protection—Protective Footwear," or the employer demonstrates that footwear is equally effective.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09013, filed 12/26/97, effective 3/1/98.]

(1999 Ed.)

WAC 296-304-09015 Hand and body protection. The employer must ensure that each affected employee uses appropriate hand protection and other protective clothing where there is exposure to hazards such as:

- Skin absorption of harmful substances;
- Severe cuts or lacerations;
- Severe abrasions;
- Punctures;
- Chemical burns;
- Thermal burns;
- Harmful temperature extremes; and
- Sharp objects.

(1) Hot work operations. The employer must ensure that an employee's clothing is free from flammable or combustible materials (such as grease or oil) while engaged in hot work operations or working near an ignition or oxygen source.

(2) Electrical protective devices. The employer must ensure that each affected employee wears protective electrical insulating gloves and sleeves or other electrical protective equipment, if that employee is exposed to electrical shock hazards while working on electrical equipment.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09015, filed 12/26/97, effective 3/1/98.]

WAC 296-304-09017 Lifesaving equipment. (1) Personal flotation devices (PFD).

(a) The employer must ensure that each personal flotation device (life preservers, life jackets and work vests) worn by an affected employee is:

- United States Coast Guard (USCG) approved and marked Type I PFD, Type II PFD, or Type III PFD; or
- USCG approved Type V PFD, marked for use as a work vest, for commercial use, or for use on vessels.

Note: The requirements for USCG approval are in 46 CFR Part 160, Subpart Q, Coast Guard Lifesaving Equipment Specifications.

(b) The employer must ensure that each personal flotation device is inspected before use for dry rot, chemical damage, or other defects that may affect its strength and buoyancy. Defective personal flotation devices shall not be used.

(2) Ring life buoys and ladders.

(a) The employer must ensure that when work is performed on a floating vessel 200 feet (61 m) or more in length, at least three 30-inch (0.76 m) U.S. Coast Guard approved ring life buoys with lines attached are located in readily visible and accessible places. Ring life buoys must be located one forward, one aft, and one at the access to the gangway.

(b) On floating vessels under 200 feet (61 m) in length, at least one 30-inch (0.76 m) U.S. Coast Guard approved ring life buoy with line attached must be located at the gangway.

(c) At least one 30-inch (0.76 m) U.S. Coast Guard approved ring life buoy with a line attached must be located on each staging alongside of a floating vessel on which work is performed.

(d) At least 90 feet (27 m) of line must be attached to each ring life buoy.

(e) There must be at least one portable or permanent ladder near each floating vessel on which work is performed.

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The ladder must be long enough to help an employee reach safety in the event of a fall into the water.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09017, filed 12/26/97, effective 3/1/98.]

WAC 296-304-09019 Fall protection—General requirement. The employer must provide and ensure the use of fall protection when employees work aloft or elsewhere at elevations more than 5 feet above a solid surface.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09019, filed 12/26/97, effective 3/1/98.]

WAC 296-304-09021 Personal fall arrest systems (PFAS). Personal fall arrest systems must meet the requirements of this section.

(1) The employer must ensure that connectors and anchorages meet the following criteria:

(a) Connectors are made of drop forged, pressed, or formed steel or of materials with equivalent strength.

(b) Connectors have a corrosion-resistant finish, and all surfaces and edges are smooth to prevent damage to the interfacing parts of the system.

(c) D-rings and snaphooks can sustain a minimum tensile load of 5,000 pounds (22.2 Kn).

(d) D-rings and snaphooks are proof-tested to a minimum tensile load of 3,600 pounds (16 Kn) without cracking, breaking, or being permanently deformed.

(e) Snaphooks lock and are designed and used to prevent disengagement of the snaphook by contact of the snaphook keeper with the connected part.

(f) On suspended scaffolds or similar work platforms with horizontal lifelines that may become vertical lifelines, the devices used for connection to the horizontal lifeline can lock in any direction on the lifeline.

(g) Anchorages used for attachment of personal fall arrest equipment are independent of any anchorage used to support or suspend platforms.

(h) Anchorages can support at least 5,000 pounds (22.2 Kn) per employee attached, or are designed, installed, and used as follows:

(i) As part of a complete personal fall arrest system that maintains a safety factor of at least two; and

(ii) Under the direction and supervision of a qualified person.

(2) The employer must ensure that lifelines, lanyards, and personal fall arrest systems meet the following criteria:

(a) When vertical lifelines are used, each employee has a separate lifeline.

(b) Vertical lifelines and lanyards have a minimum tensile strength of 5,000 pounds (22.2 Kn).

(c) Self-retracting lifelines and lanyards that automatically limit free fall distances to 2 feet (0.61 m) or less can sustain a minimum tensile load of 3000 pounds (13.3 Kn) applied to a self-retracting lifeline or lanyard with the lifeline or lanyard in the fully extended position.

(d) Self-retracting lifelines and lanyards which do not limit free fall distance to 2 feet (0.61 m) or less, ripstitch lanyards and tearing and deforming lanyards can sustain a minimum static tensile load of 5,000 pounds (22.2 Kn) applied to the device when they are in the fully extended position.

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(e) Horizontal lifelines are designed, installed, and used under the supervision of a qualified person, and only used as part of a complete personal fall arrest system that maintains a safety factor of at least two.

Note: The system strength needs below are based on a maximum combined weight of employee and tools of 310 pounds. If combined weight is more than 310 pounds, appropriate allowances must be made or the system will not be in compliance.

(f) Effective April 20, 1998, the employer must ensure that personal fall arrest systems:

(i) Limit the maximum arresting force on a falling employee to 1,800 pounds (8 Kn) when used with a body harness;

(ii) Bring a falling employee to a complete stop and limit the maximum deceleration distance an employee travels to 3.5 feet (1.07 m); and

(iii) Are strong enough to withstand twice the potential impact energy of an employee free falling a distance of 6 feet (1.8 m), or the free fall distance permitted by the system, whichever is less.

(g) The employer must ensure that personal fall arrest systems are rigged so that an employee can neither free fall more than 6 feet (1.8 m) nor contact any lower level.

(3) The employer must select, use, and care for systems and system components according to the following requirements:

(a) Lanyards are attached to employees using personal fall arrest systems, as follows:

The attachment point of a body harness is in the center of the wearer's back near the shoulder level, or above the wearer's head. If the maximum free fall distance is 20 inches, the attachment point may be located in the chest position.

(b) Ropes and straps (webbing) used in lanyards, lifelines and strength components of body harnesses are made from synthetic fibers or wire rope.

(c) Ropes, harnesses, and lanyards are compatible with their hardware.

(d) Lifelines and lanyards are protected against cuts, abrasions, burns from hot work operations and deterioration by acids, solvents, and other chemicals.

(e) Personal fall arrest systems are inspected before each use for mildew, wear, damage, and other deterioration. Defective components are removed from service.

(f) Personal fall arrest systems and components subjected to impact loading are immediately removed from service and not used again for employee protection until inspected and determined by a qualified persons to be undamaged and suitable for reuse.

(g) The employer must provide for prompt rescue of employees in the event of a fall or must ensure that employees are able to rescue themselves.

(h) Personal fall arrest systems and components are used only for employee fall protection and not to hoist materials.

(4) Training. Before using personal fall arrest equipment, the employer must ensure that each affected employee is trained to understand the application limits of the equipment and proper hook-up, anchoring, and tie-off techniques. Affected employees must also be trained to demonstrate the proper use, inspection, and storage of their equipment.

(1999 Ed.)

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09021, filed 12/26/97, effective 3/1/98.]

WAC 296-304-09023 Positioning device systems. The employer must ensure that positioning device systems and their use meet the requirements of this section.

(1) The employer must ensure that connectors and anchorages meet the following criteria:

(a) Connectors have a corrosion-resistant finish, and all surfaces and edges are smooth to prevent damage to interfacing parts of this system.

(b) Connecting assemblies have a minimum tensile strength of 5,000 pounds (22.2 Kn).

(c) Positioning device systems are secured to an anchorage that can support at least twice the potential impact load of an employee's fall.

(d) Only locking type snaphooks are used in positioning device systems.

(2) The employer must ensure that positioning device systems meet the following criteria:

(a) Restraint (tether) lines have a minimum breaking strength of 3,000 pounds (13.3 Kn).

(b) Beginning April 20, 1998, the following system performance criteria for positioning device systems are met:

(i) A window cleaner's positioning system can withstand without failure, a drop test consisting of a 6-foot (1.83 m) drop of a 250-pound (113 kg) weight. The system limits the initial arresting force to a maximum of 2,000 pounds (8.89 Kn), with a maximum duration of 2 milliseconds. The system limits any subsequent arresting forces imposed on the falling employee to a maximum of 1,000 pounds (4.45 Kn);

(ii) All other positioning device systems can withstand without failure a drop test consisting of a 4-foot (1.2 m) drop of a 250-pound (113 kg) weight.

(3) The employer must ensure that a positioning device system is used and cared for according to the following requirements:

(a) Positioning device systems are inspected before each use for mildew, wear, damage, and other deterioration. Defective components are removed from service.

(b) A positioning device system or component subjected to impact loading is immediately removed from service and not used again for employee protection, unless inspected and determined by a qualified person to be undamaged and suitable for reuse.

(4) Training. Before using a positioning device system, the employer must ensure that employees are trained in the application limits, proper hook-up, anchoring and tie-off techniques, methods of use, inspection, and storage of positioning device systems.

[Statutory Authority: RCW 49.17.040, [49.17].050 and [49.17].060. 98-02-006, § 296-304-09023, filed 12/26/97, effective 3/1/98.]

WAC 296-304-100 Ship's machinery and piping systems—Scope and application. All sections of this chapter which include WAC 296-304-100 in this section number apply to ship's machinery and piping systems and sections WAC 296-304-10001 to 296-304-10007 apply only to ship-building and ship repairing.

[Order 74-25, § 296-304-100, filed 5/7/74.]

(1999 Ed.)

WAC 296-304-10001 Ship's boilers. (1) Before work is performed in the fire, steam, or water spaces of a boiler where employees may be subject to injury from the direct escape of a high temperature medium, such as steam, or water, oil, or other medium at a high temperature entering from an interconnecting system, the employer shall insure that the following steps are taken:

(a) The isolation and shutoff valves connecting the dead boiler with the live system or systems shall be secured, blanked, and tagged indicating that employees are working in the boiler. This tag shall not be removed nor the valves unblanked until it is determined that this may be done without creating a hazard to the employees working in the boiler, or until the work in the boiler is completed. Where valves are welded instead of bolted at least two isolation and shutoff valves connecting the dead boiler with the live system or systems shall be secured, locked and tagged.

(b) Drain connections to atmosphere on all of the dead interconnecting systems shall be opened for visual observation of drainage.

(d) A warning sign calling attention to the fact that employees are working in the boilers shall be hung in a conspicuous location in the engine room. This sign shall not be removed until it is determined that the work is completed and all employees are out of the boilers.

[Order 74-25, § 296-304-10001, filed 5/7/74.]

WAC 296-304-10003 Ship's piping systems. (1) Before work is performed on a valve, fitting, or section of piping in a piping system where employees may be subject to injury from the direct escape of steam, or water, oil, or other medium at a high temperature, the employer shall insure that the following steps are taken:

(a) The isolation and shutoff valves connecting the dead system with the live system or systems shall be secured, blanked, and tagged indicating that employees are working on the systems. This tag shall not be removed nor the valves unblanked until it is determined that this may be done without creating a hazard to the employees working on the system, or until the work on the system is completed. Where valves are welded instead of bolted at least two isolation and shutoff valves connecting the dead system with the live system or systems shall be secured, locked, and tagged.

(b) Drain connections to atmosphere on all of the dead interconnecting systems shall be opened for visual observation of drainage.

[Order 74-25, § 296-304-10003, filed 5/7/74.]

WAC 296-304-10005 Ship's propulsion machinery. (1) Before work is performed on the main engine, reduction gear, or connecting accessories, the employer shall ensure that the following steps are taken:

(a) The jacking gear shall be engaged to prevent the main engine from turning over. A sign shall be posted at the throttle indicating that the jacking gear is engaged. This sign shall not be removed until the jacking gear can be safely disengaged.

(b) If the jacking gear is steam driven, the stop valves to the jacking gear shall be secured, locked, and tagged indicating that employees are working on the main engine.

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(c) If the jacking gear is electrically driven, the circuit controlling the jacking gear shall be deenergized by tripping the circuit breaker, opening the switch or removing the fuse, whichever is appropriate. The breaker, switch, or fuse location shall be tagged indicating that employees are working on the main engine.

(2) Before the jacking engine is operated, the following precautions shall be taken:

(a) A check shall be made to ensure that all employees, equipment, and tools are clear of the engine, reduction gear, and its connecting accessories.

(b) A check shall be made to ensure that all employees, equipment and tools are free of the propeller.

(3) Before work is started on or in the immediate vicinity of the propeller, a warning sign calling attention to the fact that employees are working in that area shall be hung in a conspicuous location in the engine room. This sign shall not be removed until it is determined that the work is completed and all employees are free of the propeller.

(4) Before the main engine is turned over (e.g., when warming up before departure or testing after an overhaul) a check shall be made to ensure that all employees, equipment, and tools are free of the propeller.

[Order 76-7, § 296-304-10005, filed 3/1/76; Order 74-25, § 296-304-10005, filed 5/7/74.]

WAC 296-304-10007 Ship's deck machinery. (1)

Before work is performed on the anchor windlass or any of its attached accessories, the employer shall ensure that the following steps are taken:

(a) The devil claws shall be made fast to the anchor chains.

(b) The riding pawls shall be in the engaged position.

(c) In the absence of devil claws and riding pawls, the anchor chains shall be secured to a suitable fixed structure of the vessel.

[Order 74-25, § 296-304-10007, filed 5/7/74.]

WAC 296-304-110 Portable, unfired pressure vessels, drums and containers, other than ship's equipment—Scope and application. All sections of this chapter which include WAC 296-304-110 in the section number apply to portable, unfired pressure vessels, drums and containers, other than ship's equipment and WAC 296-304-11001 to 296-304-11003 applies only to shipbuilding and ship repairing.

[Order 74-25, § 296-304-110, filed 5/7/74.]

WAC 296-304-11001 Portable air receivers and other unfired pressure vessels. (1) Portable, unfired pressure vessels, built after the effective date of this regulation, shall be marked and reported indicating that they have been designed and constructed to meet the standards of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section VIII, Rules for Construction of Unfired Pressure Vessels, 1963. They shall be subjected to a hydrostatic pressure test of one and one-half times the working pressure of the vessels.

(2) Portable, unfired pressure vessels, not built to the code requirements of (1) of this section, and built prior to the

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effective date of this regulation, shall be examined quarterly by a competent person, and approved by the state boiler inspecting division. They shall be subjected yearly to a hydrostatic pressure test of one and one-half times the working pressure of the vessels.

(3) The relief valves on the portable, unfired pressure vessels in (1) and (2) of this section shall be set to the safe working pressure of the vessels, or set to the lowest safe working pressure of the systems, whichever is lower.

(4) A record of such examinations and tests made in compliance with the requirements of (1) and (2) of this section shall be maintained.

[Order 74-25, § 296-304-11001, filed 5/7/74.]

WAC 296-304-11003 Drums and containers. (1) Shipping drums and containers shall not be pressurized to remove their contents.

(2) A temporarily assembled pressurized piping system conveying hazardous liquids or gases shall be provided with a relief valve and by-pass to prevent rupture of the system and the escape of such hazardous liquids or gases.

(3) Pressure vessels, drums and containers containing toxic or flammable liquids or gases shall not be stored or used where they are subject to open flame, hot metal, or other sources of artificial heat.

(4) Unless pressure vessels, drums and containers of 30 gallon capacity or over containing flammable or toxic liquids or gases are placed in an out-of-the-way area where they will not be subject to physical injury from an outside source, barriers or guards shall be erected to protect them from such physical injury.

(5) Containers of 55 gallons or more capacity containing flammable or toxic liquid shall be surrounded by dikes or pans which enclose a volume equal to at least 25 percent of the total volume of the containers.

(6) Fire extinguishers adequate in number and suitable for the hazard shall be provided. These extinguishers shall be located in the immediate area where pressure vessels, drums and containers containing flammable liquids or gases are stored or in use. Such extinguishers shall be ready for use at all times.

[Order 74-25, § 296-304-11003, filed 5/7/74.]

WAC 296-304-120 Electrical machinery—Electrical circuits and distribution boards. (1) Before an employee is permitted to work on an electrical circuit, except when the circuit must remain energized for testing and adjusting, the circuit shall be deenergized and checked at the point at which the work is to be done to insure that it is actually deenergized. When testing or adjusting an energized circuit a rubber mat, duck board, or other suitable insulation shall be used underfoot where an insulated deck does not exist.

(2) Deenergizing the circuit shall be accomplished by opening the circuit breaker, opening the switch, or removing the fuse, whichever method is appropriate. The circuit breaker, switch, or fuse location shall be tagged to indicate that an employee is working on the circuit. Such tags shall not be removed nor the circuit energized until it is definitely determined that the work on the circuit has been completed.

(1999 Ed.)

(3) When work is performed immediately adjacent to an open-front energized board or in back of an energized board, the board shall be covered or some other equally safe means shall be used to prevent contact with any of the energized parts.

Note: WAC 296-304-120 is applicable only to shipbuilding and ship repairing.

[Order 74-25, § 296-304-120, filed 5/7/74.]

WAC 296-304-130 Gear certification—General provisions. All sections of this chapter which include WAC 296-304-130 in the section number apply to gear certification.

[Order 74-25, § 296-304-130, filed 5/7/74.]

WAC 296-304-13001 Purpose and scope. (1) The regulations in this part implement WAC 296-304-07001 through 296-304-07013. They provide procedures and standards governing accreditation of persons by the department of labor and industries, for the purpose of certificating shore-based material handling devices, and the manner in which such certification shall be performed.

(2) Accreditation is not required, and the regulations of this part are not applicable, under the following circumstances:

(a) Persons not required to be accredited for gear certification purposes, may, nevertheless, apply for and receive accreditation by the department of labor and industries. The appropriate portions of this section shall apply to persons accredited except insofar as exemptions may be granted.

[Order 74-25, § 296-304-13001, filed 5/7/74.]

WAC 296-304-13003 Definitions of terms. (1) "Vessel" means every description of watercraft or other artificial contrivance used or capable of being used, as a means of transportation on water, including special-purpose floating structures not primarily designed for or used as a means of transportation on water.

(2) Except as otherwise noted, "cargo gear," as used in WAC 296-304-140 through 296-304-17023, includes that gear forming a part of a vessel's equipment which is used for the handling of cargo other than bulk liquids, but does not include gear which is used only for handling or holding hoses, handling ships' stores, handling the gangway, or boom conveyor belt systems for the self-unloading of bulk cargo vessels.

(3) With reference to equipment covered by this section.

(a) "Derrick" means—

(i) When applied to vessels' cargo handling gear, a mechanical device for lifting, including a boom which is suspended at its head by a topping lift from a mast, king post, or similar structure, controlled in the horizontal plane by vangs, and used either singly or in pairs with married falls;

(ii) When applied to shore-based material handling devices, a mechanical device intended for lifting, with or without a boom supported at its head by a topping lift from a mast, fixed A frame, or similar structure. The mast or equivalent member may or may not be supported by guys or braces. The boom, where fitted, may or may not be controlled in the horizontal plane by guys (vangs). The term includes shear legs.

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(b) "Crane" means a mechanical device intended for lifting or lowering a load and moving it horizontally, in which the hoisting mechanism is an integral part of the machine. A crane may be a fixed or mobile machine.

(c) "Bulk cargo spout" means a spout, which may or may not be telescopic and may or may not have removable sections, but is suspended over the vessel from some overhead structure by wire rope or other means. Such a spout is often used with a "thrower" or "trimming machine." A grain loading spout is an example of those covered by this definition.

(d) "Bulk cargo sucker" means a pneumatic conveyor which utilizes a spout-like device, which may be adjustable vertically and/or laterally, and which is suspended over a vessel from some overhead structure by wire rope or other means. An example of an installation of this nature is the "grain sucker" used to discharge grain from barges.

(4) "Director" means the director of the department of labor and industries, or his authorized representative.

(5) "Bureau" means the Bureau of Labor Standards, U.S. Department of Labor.

(6) "Person" includes any individual, partnership, corporation, agency, association, or organization.

(7) "Competent person" means:

(a) An individual qualified to perform gear certification functions with respect to vessels' cargo handling gear, as specifically set forth in WAC 296-304-17023.

(b) An individual qualified under the provisions of WAC 296-304-180 through 296-304-18003 and 296-304-190 through 296-304-19001 to perform gear certification functions with respect to shore-based material handling devices.

(8) "Ton" means a ton of 2,240 pounds when applied to vessels' cargo handling gear, and a ton of 2,000 pounds when applied to shore-based material handling devices or to shore-type cranes permanently mounted aboard barges or other vessels employed in domestic trade and designed on the basis of the 2,000-pound ton. Capacity ratings may be stated in pounds.

(9) "Nondestructive" examination means examination of structure or parts by electronic, ultrasonic, or other nondestructive examination suitable for the purpose.

[Order 74-25, § 296-304-13003, filed 5/7/74.]

WAC 296-304-140 Procedure governing accreditation—Scope and application. All sections of this chapter which include WAC 296-304-140 in the section number apply to procedure governing accreditation.

[Order 74-25, § 296-304-140, filed 5/7/74.]

WAC 296-304-14001 Application for accreditation.

(1) Application. Any person seeking accreditation shall file an original and duplicate copy of an application for accreditation with the director of the department of labor and industries, on a form provided by the department of labor and industries, for this purpose. Each application shall be signed and certified by the applicant and, if the applicant is an agency or organization, by a responsible officer of such agency or organization.

(2) Contents of application. The application form shall include the following information:

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(a) A statement detailing the applicable types of work performed by the applicant in the past, noting the amount and extent of such work performed within the previous three years, listing representative vessels involved, and including representative job orders if available, or equivalent evidence;

(b) Descriptive details concerning any testing instruments and heat treatment furnaces which are to be used in conducting required tests or heat treatments. Test reports indicating that instruments meet the accuracy standards set forth in this section shall be included;

(c) A list setting forth the ports in which applicant currently conducts his business as well as those in which he proposes to conduct gear certification activities;

(d) A list of the applicant's responsible qualified personnel, both supervisory and managerial and including any surveyors, with resumes of their individual experience in the testing, examination, inspection and heat treatment of cargo gear. Such list shall include any branch office personnel or surveyors appointed to act in the applicant's behalf in any of the ports of the United States: *Provided, however,* That where the submission of individual resumes would be unduly burdensome because of the large number of persons engaged in the applicant's behalf, the applicant, after stating this fact, need only submit a list of its personnel together with a detailed statement of the qualifications upon which the appointment of surveyors is based;

(e) Names of at least three business references who will furnish information regarding work performed by the applicant;

(f) Any additional information the applicant deems to be pertinent.

[Order 74-25, § 296-304-14001, filed 5/7/74.]

WAC 296-304-14003 Action upon application. (1)

Upon receipt of an application for accreditation, the director shall approve or deny the application. The director may conduct an investigation, which may include a hearing, prior to approving or denying an application. To the extent he deems appropriate, the director may provide an opportunity to other interested persons to present data and views on the application prior to approval or denial.

(2) Any application which fails to present the information required by the prescribed form may be returned to the applicant with a notation of deficiencies and without prejudice to submission of a new or revised application.

(3) If the application is approved, notice of approval shall be mailed to the applicant. If the application is denied, notice of such denial shall be mailed to the applicant and such denial shall be without prejudice to any subsequent application except where such action is deemed to be in the public interest. In the event an application is denied with prejudice, the provisions of WAC 296-304-14013 shall be applicable.

(4) A copy of the notice of accreditation shall be kept on file by applicant at the applicant's place of business.

[Order 74-25, § 296-304-14003, filed 5/7/74.]

WAC 296-304-14005 Duration and renewal of accreditation. The period of accreditation shall not exceed three years. Applications for renewal of accreditation shall be made on the same form as described in WAC 296-304-

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14001. No accreditation shall expire until action on an application for renewal shall have been finally determined: *Provided,* That such application has been properly executed in accordance with WAC 296-304-14001 and filed with and received by the director not less than 15 nor more than 60 days prior to the expiration date. A final determination means either the approval or initial denial of the application for renewal. The procedure specified in WAC 296-304-14003 shall be applicable to all applications for renewal.

[Order 74-25, § 296-304-14005, filed 5/7/74.]

WAC 296-304-14007 Criteria governing accreditation to certificate vessels' cargo gear. (1) A person applying for accreditation to issue registers and pertinent certificates, to maintain registers and appropriate records, and to conduct initial, annual and quadrennial surveys, shall not be accredited unless he is engaged in one or more of the following activities:

- (a) Classification of vessels;
- (b) Certification of vessels' cargo gear;
- (c) Shipbuilding or ship repairing, or both insofar as related to work on vessels' cargo handling gear;
- (d) Unit and loose gear testing of vessels' cargo handling gear.

(2) Applicants for accreditation under WAC 296-304-14007(1) for operations in coastal or Great Lakes ports who come within WAC 296-304-14007 (1)(b) or (d) shall not be accredited unless they conduct at least 1,500 hours of cargo gear certification work per year.

(3) A person applying for accreditation to carry out tests of loose gear or wire rope, or both, or to carry out heat treatments, and to issue the related certificates, shall be engaged in one or both of the following activities:

- (a) Testing of loose gear or wire rope, or both;
- (b) Heat treatment of chains and loose cargo gear.

(4) A person applying for accreditation shall be staffed by individuals technically qualified to conduct the inspections and examinations and to conduct or supervise tests and heat treatments prescribed in this part. Any representatives, agents or surveyors acting on behalf of a person applying for accreditation in ports in which such operations are conducted shall be similarly qualified.

(a) Accreditation to conduct such nondestructive examination as may be a part of any certification activity may be granted to applicants found competent and equipped to carry out this activity.

(5) Except as noted in WAC 296-304-13501(3), and unless exemptions are granted under WAC 296-304-15001(8), a person applying for accreditation as specified in WAC 296-304-14007(1) shall be prepared to carry out all of the requirements of WAC 296-304-150 through 296-304-15005, 296-304-160 through 296-304-16025, and 296-304-170 through 296-304-17023 except that loose gear and wire rope tests and heat treatments may be carried out by the manufacturer of the gear concerned or by another person accredited specifically for this purpose.

(6) A person applying for accreditation shall have a satisfactory record of performance.

[Order 74-25, § 296-304-14007, filed 5/7/74.]

WAC 296-304-14009 Voluntary amendment or termination of accreditation. The accreditation of any person may be voluntarily amended or terminated upon written request filed with the director.

[Order 74-25, § 296-304-14009, filed 5/7/74.]

WAC 296-304-14011 Suspension or revocation of accreditation. The director may suspend or revoke an accreditation of any person for cause. Except in cases of willfulness or cases in which the public interest requires otherwise, before any accreditation is suspended or revoked facts or conduct which may warrant such action shall be called to the attention of the person involved in writing and that person shall be afforded an opportunity to achieve or demonstrate appropriate compliance.

[Order 74-25, § 296-304-14011, filed 5/7/74.]

WAC 296-304-14013 Reconsideration and review. (1) Any person aggrieved by the action of the director or his authorized representative in denying, granting, suspending or revoking an accreditation under this section may within 15 days after such action, (a) file a written request for reconsideration thereof by the director or the authorized representative of the director who made the decision in the first instance, or (b) file a written request for review of the decision by the director or an authorized representative of the director, who has taken no part in the action which is the subject for review.

(2) A request for reconsideration shall be granted where the applicant shows that there is additional evidence which may materially affect the decision and that there were reasonable grounds for failure to adduce such evidence in the original proceedings.

(3) Any person aggrieved by the action of the director or authorized representative of the director in denying a request for reconsideration may, within 15 days after the denial of such request, file with the director or his authorized representative a written request for review.

(4) Any person aggrieved by the reconsidered determination of the director or authorized representative of the director, may within 15 days after such determination, file with the director a written request for review.

(5) A request for review shall be granted where reasonable grounds for the review are set forth in the request.

(6) If a request for reconsideration or review is granted, all interested persons shall be afforded an opportunity to present their views.

(7) No cargo gear certification function shall be performed by any person seeking reconsideration or review under this section pending the final decision with respect to such reconsideration or review.

[Order 74-25, § 296-304-14013, filed 5/7/74.]

WAC 296-304-150 Duties of persons accredited to certificate vessels' cargo gear—Scope and application. All sections of this chapter which include WAC 296-304-150 in the section number apply to duties of persons accredited to certificate vessels' cargo gear.

[Order 74-25, § 296-304-150, filed 5/7/74.]

(1999 Ed.)

WAC 296-304-15001 General duties—Exemptions.

(1) Except as noted in WAC 296-304-13501 and 296-304-15001(8), the requirements set forth in WAC 296-304-160 through 296-304-16025 and 296-304-170 through 296-304-17023 shall be strictly adhered to in all testing, examinations, inspections and heat treatments.

(2) Supervision of all testing, examinations, inspections, and heat treatments shall be carried out only by such persons as are listed in the application for accreditation or subsequent supplements thereto, submitted pursuant to this section.

(3) The certificates issued by an accredited person shall be signed and all register entries made only by an authorized agent of such accredited person. No certification shall be issued until any deficiencies considered by the accredited person to constitute a currently unsatisfactory condition have been corrected. Replacement parts shall be of equal or better quality as original equipment and suitable for the purpose. In the event deficiencies remain uncorrected and no certification may therefore be issued, the accredited person shall inform the nearest district office of the department of labor and industries of the circumstances.

(4) Dynamometers or other recording test equipment owned by an accredited person shall have been tested for accuracy within the six months next preceding application for accreditation or renewal of same. Such test shall be performed with calibrating equipment which has been checked in turn so that indications are traceable to the U.S. Bureau of Standards. A copy of test reports shall accompany the application. Where test equipment is not the property of the accredited person, that person shall not issue any certificate based upon the use of such equipment unless its owner has made available a certificate of accuracy based on the requirements of this section, obtained within 1 year prior to such use, and stating the errors of the equipment. Reasonable standards of accuracy shall be met and proof loads adjusted as necessary.

(5) An accredited person shall, upon request, provide the nearest local office of the department of labor and industries with advance information as to scheduled testing or of such other functions as are performed and facilitate the department of labor and industries observation of any such activities as it may desire to witness: *Provided, however,* That tests need not be delayed, except when specifically requested by the department of labor and industries under unusual circumstances.

(6) All cargo gear registers or certificates issued by an accredited person shall be made on forms prescribed or approved by the department of labor and industries.

(7) Unless otherwise instructed by the director in specific instances, any person accredited under WAC 296-304-14007(1) shall accept certificates relating to loose gear or wire rope tests or to heat treatments which are issued by the manufacturer of the gear concerned, by another person accredited specifically by the director for this purpose, or by any other person whose certificates are acceptable to the department of labor and industries. Such certificates shall either be attached as a part of the vessel's certification or shall be used as the basis for the issuance of the accredited person's own loose gear, wire rope, or heat treatment certificates. In the latter case, the original certificates shall be kept on file by

the accredited person as part of the permanent record of the vessel concerned.

(8) In case of practical difficulties or unnecessary hardships, the director in his discretion may grant exemptions from any provision of WAC 296-304-150 through 296-304-15005, 296-304-160 through 296-304-16025 and 296-304-170 through 296-304-17023.

[Order 74-25, § 296-304-15001, filed 5/7/74.]

WAC 296-304-15003 Recordkeeping and related procedures concerning records in custody of accredited persons. (1) An accredited person shall maintain records of all work performed under WAC 296-304-160 through 296-304-16025 and 296-304-170 through 296-304-17023.

(2) An accredited person shall maintain a continuous record of the status of the certification of each vessel issued a register by such person.

(3) The records required in (1) and (2) of this section shall be available for examination by the director.

(4) When annual or quadrennial tests, inspections, examinations, or heat treatments are performed by an accredited person, other than the person who originally issued the vessel's register, such accredited person shall furnish copies of any certificates issued and information as to register entries to the person originally issuing the register.

(5) An accredited person shall inform the nearest local office of the department of labor and industries whenever a vessel is initially certificated under these regulations and a register in the prescribed form has been issued.

(6) A copy of each certificate relating to unit tests or thorough examinations, except those issued by the manufacturer and those issued by accredited persons outside of the United States, shall be sent to the nearest local office of the department of labor and industries within 10 days after issuance. Such records shall form a part of the department of labor and industries file on the accredited person.

(7) An accredited person shall promptly notify the nearest local office of the department of labor and industries with respect to any changes in technical personnel, in fee schedules in geographical areas in which operations are conducted, or other pertinent substantial changes in its organization or operations.

[Order 74-25, § 296-304-15003, filed 5/7/74.]

WAC 296-304-15005 Recordkeeping and related procedures concerning records in custody of the vessel. (1) A fully completed and up-to-date register shall be kept in the form prescribed or approved by the department of labor and industries, giving the particulars required with respect to:

(a) The inspections and thorough examinations required by WAC 296-304-16005 (1) and (2).

(b) The thorough examinations required by WAC 296-304-16005(3).

(c) The thorough examinations required by WAC 296-304-16009.

(d) The heat treatment required by WAC 296-304-16007(1) and (2), and 296-304-16013.

(2) Certificates in the form prescribed or approved by the department of labor and industries shall be kept up-to-date,

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be attached to the register, and shall contain the particulars required with respect to:

(a) The testing and examinations required by WAC 296-304-16003, 296-304-16005(1) and 296-304-16013.

(b) The heat treatment required by WAC 296-304-16007 and 296-304-16013.

(3) The certificates and entries in the register shall be signed by a person qualified under WAC 296-304-17023.

(4) Adequate means shall be provided to enable persons examining the register, or any certificate attached thereto, to identify items of cargo gear referred to therein. Small items of gear, such as shackles, shall bear a mark to indicate that they have been initially tested.

(5) Records shall be kept aboard vessels identifying wire rope or articles of loose gear obtained from time to time and required to be certificated under the regulations of this section.

(6) An accredited person shall instruct the vessel's officers or the vessel's operator if the vessel is unmanned, that the vessel's register and certificates shall be preserved for at least 4 years after the date of the latest entry except in the case of nonrecurring test certificates concerning gear which is kept in use for a longer period, in which event the pertinent certificates shall be retained so long as that gear is continued in use.

(7) In cases where derricks, spouts, suckers, or cranes are mounted permanently aboard barges which remain in domestic inland waters service, the certification documentation shall comply with the provisions of WAC 296-304-20025.

[Order 74-25, § 296-304-15005, filed 5/7/74.]

WAC 296-304-160 Certification of vessels' cargo gear—Scope and application. All sections of this chapter which include WAC 296-304-160 in the section number apply to certification of vessels' cargo gear.

[Order 74-25, § 296-304-160, filed 5/7/74.]

WAC 296-304-16001 General. (1) Except as noted in WAC 296-304-13501 and as provided in exemptions under WAC 296-304-15001(9), certification performed by accredited persons shall conform to the requirements contained in this section.

(2) Safe working loads assigned to assembled units of gear shall be based on applicable design criteria acceptable to the accredited person. Where no design data on which to base a rating is obtainable, the safe working load ratings assigned shall be based on the owner's information and warranty that those so assigned are correct. Unit test certificates shall state the basis for any such safe working load assignment.

[Order 74-25, § 296-304-16001, filed 5/7/74.]

WAC 296-304-16003 Initial tests of cargo gear and tests after alterations, renewals or repairs. (1) Before being taken into use, hoisting machines, fixed gear aboard vessels accessory thereto, and loose gear and wire rope used in connection therewith, shall be tested and examined and the safe working load thereof certified in the manner set forth in WAC 296-304-170 through 296-304-17023.

(2) Replacement or additional loose gear and wire rope obtained from time to time shall also be tested and examined in the manner set forth in WAC 296-304-16003(1). However,

the replacement of a component part of an article of loose gear, such as a sheave, pin, or bushing does not require a new test certificate so long as the new component at least equals in all particulars the part replaced.

(3) In the case of untested gear which has been in use, an initial test in conformance with WAC 296-304-16003(1) shall be carried out: *Provided, however*, That existing standing rigging and wire rope will not be required to be tested but shall be thoroughly examined to ascertain its fitness for continued use in conformance with the requirements of WAC 296-304-16023 and 296-304-16025.

(4) In the case of important alterations or renewals of the machinery and gear and also after repairs due to failure of or damage to other than loose components, a test as required in WAC 296-304-16003(1) shall be carried out.

(5) If the operation in which cargo gear is engaged never utilizes more than a fraction of the safe working load rating, the owner may, at his option, have said gear certificated for, and limited in operation to, a lesser maximum safe working load: *Provided, however*, That the gear concerned is physically capable of operation at the original load rating and the load reduction is not for the purpose of avoiding correction of any deficiency.

(6) In no case shall safe working loads be increased beyond the original design limitations unless such increase is based on engineering calculations by or acceptable to the accredited certification agency, and all necessary structural changes are carried out.

[Order 74-25, § 296-304-16003, filed 5/7/74.]

WAC 296-304-16005 Periodic tests, examinations and inspections. After being taken into use, every hoisting machine, all fixed gear aboard vessels accessory thereto and loose gear used in connection therewith, shall be tested, thoroughly examined or inspected as follows:

(1) Derricks with their winches and accessory gear, including the attachments, as a unit; and cranes and other hoisting machines with their accessory gear, as a unit, shall be tested and thoroughly examined every four years in the manner set forth in WAC 296-304-170 through 296-304-17023.

(2) Derricks, their permanent attachments and any other fixed gear the dismantling of which is especially difficult shall be visually inspected every twelve months. In order to facilitate such inspection all derricks shall be lowered.

(3) All hoisting machines (e.g., cranes, winches), blocks, shackles, and all other accessory gear not included in WAC 296-304-16005(2), shall be thoroughly examined every twelve months by means of a visual examination, supplemented as necessary by other means, such as a hammer test or with electronic, ultrasonic, or other nondestructive methods, carried out as carefully as conditions permit in order to arrive at a reliable conclusion as to the safety of the parts examined. Particular attention shall be paid to the suitability for continued use of all swivels and the pins and bushing of blocks. If necessary, parts of the machines or gear shall be dismantled. If blocks are disassembled, all shell bolt nuts shall be securely locked upon reassembly.

(4) Where a derrick or crane is mounted on a barge hull and ballast tanks within the hull are used to facilitate use of

the derrick or crane, or uncontrolled free surface may be a factor, each annual inspection or examination, as required, shall include such inspection as is necessary for the purpose of determining the integrity of any internals contributing to stability under conditions of use. The owner shall provide the accredited person with necessary information on any ballasting arrangements required.

(5) Annual inspection or examination, as required, shall include, among other things, examination of the following:

(a) Derrick heel attachment points. Heel pins may, if possible, be examined by nondestructive examination.

(b) Shrouds and stays necessary in the use of the gear, together with attachment points.

(c) Deck fittings for the securing of vang, topping lifts, and/or preventers.

(d) Means of attachment to the hull of "A" frame or other fixed derrick or crane structure and of mobile types of equipment permanently placed aboard the barge or vessel.

(e) Clamshell buckets or other similar equipment, such as magnets, etc., used in conjunction with a derrick or crane mounted aboard a vessel, with particular attention to closing line wires and sheaves. The accredited person may supplement such examination by requesting any operational tests he may deem appropriate.

(f) Winch and other operating drums for excessive wear or defect.

[Order 74-25, § 296-304-16005, filed 5/7/74.]

WAC 296-304-16007 Heat treatment. (1) All chains (other than bridle chains attached to derricks or masts), rings, hooks, shackles, and swivels made of wrought iron, which are used in hoisting or lowering, shall be annealed in accordance with WAC 296-304-17021 at the following intervals:

(a) Half inch and smaller chains, rings, hooks, shackles, and swivels in general use, at least once every six months; and

(b) All other chains, rings, hooks, shackles, and swivels in general use, at least once every twelve months.

(c) In the case of gear used solely on lifting machinery worked by hand, twelve months shall be substituted for six months in WAC 296-304-16007 (1)(a) and two years for twelve months in WAC 296-304-16007 (1)(b).

(d) When used in this paragraph, the term "in general use" means used on fifty-two or more days in a year. In any case, however, the period between annealings shall not exceed two years.

(2) Chains, rings, hooks, shackles, and swivels made of material other than wrought iron or steel shall be heat treated when necessary in accordance with WAC 296-304-17021(2).

[Order 74-25, § 296-304-16007, filed 5/7/74.]

WAC 296-304-16009 Exemptions from heat treatment. Gear made of steel, or gear which contains (as in ball bearing swivels), or is permanently attached to (as with blocks), equipment made of materials which cannot be subjected to heat treatment, shall be exempt from the requirements of WAC 296-304-16007. Such gear, however, shall be thoroughly examined in the manner described in WAC 296-304-16005(3).

[Order 74-25, § 296-304-16009, filed 5/7/74.]

WAC 296-304-16011 Grace periods. Grace periods allowed in connection with the requirements of this section are as follows:

- (1) Annual or six-month requirements - by the end of the voyage during which they become due;
- (2) Quadrennial requirements - within six months after the date when due;
- (3) Grace periods shall not be deemed to extend subsequent due dates.

[Order 74-25, § 296-304-16011, filed 5/7/74.]

WAC 296-304-16013 Gear requiring welding. Chains or other gear which have been lengthened, altered or repaired by welding, shall be properly heat treated where necessary, and, before again being put into use, shall be tested and reexamined in the manner set forth in WAC 296-304-170 through 296-304-17023.

[Order 74-25, § 296-304-16013, filed 5/7/74.]

WAC 296-304-16015 Damaged components. (1) Pursuant to WAC 296-304-18003, any derrick or associated permanent fitting which is deformed in service between surveys shall be subjected to proof test to determine its suitability for continued service. If a proof test indicates that the derrick or associated permanent fitting may be continued in service without repair, a note of the existing deformity shall be made on the test certificate. When, in the opinion of the accredited person, it is unsafe to conduct a proof test with an existing deformity, the derrick or associated permanent fitting shall be replaced or repaired and then subjected to proof test in accordance with WAC 296-304-170 through 296-304-17023.

(2) Any loose gear components which are injured or deformed by a proof load shall be replaced before a certificate is issued.

(3) Any derrick, other fixed installation, or associated permanent fitting, which is injured or deformed by a proof load shall be replaced or repaired and another proof load test shall be conducted without damage before a certificate is issued.

[Order 74-25, § 296-304-16015, filed 5/7/74.]

WAC 296-304-16017 Marking and posting of safe working loads. (1) The safe working load of the assembled gear and the minimum angle to the horizontal at which this load may be applied shall be plainly marked at the heels of all booms along with the date of the test. Where gear is certificated for use in union purchase, the union purchase safe working load shall also be plainly marked. Any limitations shall be noted in the vessel's papers.

(2) The safe working load shall be marked on all blocks used in hoisting or lowering.

(3) When the capacity of the boom of a crane or derrick has been or will be rated in accordance with the variance of its radius, the maximum safe working loads for the various working angles of the boom and the maximum and minimum radius at which the boom may be safely used, shall be conspicuously posted near the controls and visible to the crane operator. Ratings may be stated in pounds. When they are stated in tons of 2,000 pounds, this fact shall be indicated.

[Order 74-25, § 296-304-16017, filed 5/7/74.]

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WAC 296-304-16019 Requirements governing braking devices and power sources. All types of winches and cranes shall be provided with means to stop and hold the proof load in any position, and the efficiency of such means shall be demonstrated. Electric winches, electrohydraulic winches fitted with electromagnetic or hydraulic brakes at the winch, or electric cranes, shall be equipped so that a failure of the electric power shall stop the motion and set the brakes without any action on the part of the operator. Current for operation of electric winches and cranes during the tests shall be taken from the vessel's circuits. Shore current may be used if it passes through the vessel's main switchboard.

[Order 74-25, § 296-304-16019, filed 5/7/74.]

WAC 296-304-16021 Means of derrick attachment. Appropriate measure shall be taken to prevent the foot of a derrick from being accidentally lifted from its socket or support during the test.

[Order 74-25, § 296-304-16021, filed 5/7/74.]

WAC 296-304-16023 Limitations on use of wire rope. (1) An eye splice made in any wire rope shall have at least three tucks with a whole strand of rope and two tucks with one-half of the wires cut out of each strand. However, this requirement shall not operate to preclude the use of another form of splice or connection which can be shown to be as efficient.

(2) Except for eye splices in the ends of wires, each wire rope used in hoisting or lowering, in guying derricks, or as a topping lift, preventer or pendant, shall consist of one continuous piece without knot or splice.

(3) Eyes in the ends of wire rope cargo falls shall not be formed by knots and, in single part falls, shall not be formed by wire rope clips.

(4) The ends of falls shall be secured to the winch drums by clamps, U-bolts, shackles or some other equally strong method. Fiber rope fastenings shall not be used.

(5) Wire rope shall not be used for the vessel's cargo gear if in any length of eight diameters, the total number of visible broken wires exceeds 10 percent of the total number of wires, or if the rope shows other signs of excessive wear, corrosion, or defect. Particular attention shall be given to the condition of those sections of wire rope adjacent to any terminal connections, those sections exposed to abnormal wear, and those sections not normally exposed for examination.

[Order 74-25, § 296-304-16023, filed 5/7/74.]

WAC 296-304-16025 Limitations on use of chains. Chains forming a part of vessel's cargo gear shall not be used when, due to stretch, the increase of length of a measured section exceeds five percent, when a link is damaged, or when other external defects are evident. Chains shall not be shortened by bolting, wiring, or knotting.

[Order 74-25, § 296-304-16025, filed 5/7/74.]

WAC 296-304-170 Certification of vessels—Tests and proof loads—Heat treatment—Competent persons—Scope and application. All sections of this chapter which include WAC 296-304-170 in the section number apply to

certification of vessels: Tests and proof loads; heat treatment; competent persons.

[Order 74-25, § 296-304-170, filed 5/7/74.]

WAC 296-304-17001 Visual inspection before tests.

Before any test under this WAC 296-304-170 through 296-304-17023 is carried out, a visual inspection of the gear involved shall be conducted and any visibly defective gear shall be replaced or repaired. The provisions of WAC 296-304-16005(4) shall be adhered to.

[Order 74-25, § 296-304-17001, filed 5/7/74.]

WAC 296-304-17003 Unit proof test—Winches, derricks and gear accessory thereto. (1) Winches, with the whole of the gear accessory thereto (including derricks, goosenecks, eye plates, eye bolts, or other attachments), shall be tested with a proof load which shall exceed the safe working load as follows:

Safe working load	Proof load
Up to 20 tons	25 percent in excess.
20-50 tons	5 tons in excess.
Over 50 tons	10 percent in excess.

(2) The proof load shall be lifted with the vessel's normal tackle with the derrick at an angle not more than 15 degrees to the horizontal, or, at the designed minimum angle when this is greater, or, when this is impracticable, at the lowest practicable angle. The angle at which the test was made shall be stated in the certificate of test. After the proof load has been lifted, it shall be swung as far as possible in both directions. In applying the proof load, the design factors of the gear concerned will determine whether the load is applied with a single part fall or with a purchase and the certificate of test shall state the means used. Where winches are fitted with mechanical brakes for manual operation they shall be demonstrated to be in satisfactory operating condition.

(3) In the case of heavy lift derrick barges, proof loads shall be applied, except as limited by design and stability considerations, at the maximum and minimum radius for which designed, as well as at any intermediate radius which the surveyor may deem necessary, and shall be swung as far as possible in both directions. Data with respect to each proof load applied shall be entered in the test certificate.

(4) No items of cargo gear furnished by outside sources shall be used as a part of the vessel's gear for the purpose of accomplishing the proof test.

(5) All tests prescribed by this section should in general be carried out by dead load, except that in the case of quadrennial tests, replacements, or renewals, spring or hydraulic balances may be used where dead loads are not reasonably available. However, no exception shall be allowed in the case of gear on new vessels.

(6) The test shall not be regarded as satisfactory unless the indicator remains constant under the proof load for a period of at least 5 minutes.

(7) The safe working load, determined pursuant to the requirements of this section, shall be applicable only to a swinging derrick. When using two fixed derricks in "union purchase" rigs, the safe working load should generally be reduced. It is recommended that owners obtain union pur-

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chase safe working load certification based upon design study and analysis by, or acceptable to, a qualified technical office of an accredited gear certification agency, with the recognition that such determinations are valid only for the conditions contemplated in the analysis.

(a) Where both guys and preventers are fitted, union purchase certification shall state whether the guy or the preventer is the working strength member, when the guy is for slewing only, and when the guy and preventor should share working loads as far as practicable.

(8) When necessary in the proof testing of heavy derricks, the appropriate shrouds and stays shall be rigged.

[Order 74-25, § 296-304-17003, filed 5/7/74.]

WAC 296-304-17005 Unit proof tests—Cranes and gear accessory thereto. (1) Except as noted in WAC 296-304-17005(5), cranes and other hoisting machines, together with gear accessory thereto, shall be tested with a proof load which shall exceed the safe working load as follows:

Safe working load	Proof load
Up to 20 tons	25 percent in excess.
20-50 tons	5 tons in excess.
Over 50 tons	10 percent in excess.

(2) The proof load shall be lifted and swung as far as possible in both directions. If the jib or boom of the crane has a variable radius, it shall be tested with proof loads, as specified in WAC 296-304-17005(1), at the maximum and minimum radius. In the case of hydraulic cranes, when owing to the limitation of pressure it is impossible to lift a load 25 percent in excess of the safe working load, it will be sufficient to lift the greatest possible load.

(3) Initial proof tests of new cranes shall be made only with a dead load as specified in WAC 296-304-17005(2).

(4) Initial tests of cranes which have been in service, quadrennial tests, or tests associated with replacements or renewals, may be made with spring or hydraulic balances where dead loads are not reasonably available, under the following conditions:

(a) Tests shall be conducted at maximum, minimum, and intermediate radius points, as well as such points in the arc of rotation as meet with the approval of the accredited person.

(b) An additional test shall be conducted with partial load and shall include all functions and movements contemplated in the use of the crane.

(5) In cases where shore-type cranes are mounted permanently aboard barges, the requirements of WAC 296-304-170 through 296-304-17023 with respect to unit proof tests and examinations shall not apply and the applicable requirements of WAC 296-304-200 through 296-304-20025 shall be adhered to with respect to unit proof tests and examinations.

[Order 74-25, § 296-304-17005, filed 5/7/74.]

WAC 296-304-17007 Limitations on safe working loads and proof loads. The proof loads specified in WAC 296-304-17003 and 296-304-17005 shall be adjusted as necessary to meet any pertinent limitations based on stability and/or on structural competence at particular radii. Safe working loads shall be reduced accordingly.

[Order 74-25, § 296-304-17007, filed 5/7/74.]

WAC 296-304-17009 Examinations subsequent to unit tests. (1) After satisfactory completion of the unit proof load tests required by WAC 296-304-17003 and 296-304-17005, the cargo gear and all component parts thereof shall be given a thorough visual examination, supplemented as necessary by other means, such as a hammer test or with electronic, ultrasonic, or other nondestructive methods, to determine if any of the parts were damaged, deformed, or otherwise rendered unsafe for further use.

(2) When the test of gear referred to in WAC 296-304-17008(1) is being conducted for the first time on a vessel, accessory gear shall be dismantled or disassembled for examination after the test. The sheaves and pins of the blocks included in this test need not be removed unless there is evidence of deformation or failure.

(3) For subsequent tests such parts of the gear shall be dismantled or disassembled after the test as necessary to determine their suitability for continued service.

(4) When blocks are disassembled all shell bolt nuts shall be securely locked upon reassembly.

(5) In carrying out the requirements of this section, replacement shall be required of:

(a) Any swivel found to have excessive tolerance as a result of wear on any bearing surface.

(b) Pins of blocks found to be shouldered, notched, or grooved from wear, in which case, in addition to replacing the pin, sheave bushings shall be examined for suitability for continued use.

[Order 74-25, § 296-304-17009, filed 5/7/74.]

WAC 296-304-17011 Proof tests—Loose gear. (1) Chains, rings, shackles and other loose gear (whether accessory to a machine or not) shall be tested with a proof load equal to that shown against the article in the following table:

Article of gear	Proof load
Chain, ring, hook, shackle or swivel	100 percent in excess of the safe working load.
Blocks:	
Single sheave block	300 percent in excess of the safe working load. ¹
Multiple sheave block with safe working load up to and including 20 tons	100 percent in excess of the safe working load.
Multiple sheave block with safe working load over 20 tons up to and including 40 tons	20 tons in excess of the safe working load.
Multiple sheave block with safe working load over 40 tons	50 percent in excess of the safe working load.

[Title 296 WAC—p. 2446]

Pitched chains used with hand-operated blocks and rings, hooks, shackles or swivels permanently attached thereto. 50 percent in excess of the safe working load.

Hand-operated blocks used with pitched chains and rings, hooks, shackles or swivels permanently attached thereto 50 percent in excess of the safe working load.

¹The proof load applied to the block is equivalent to twice the maximum resultant load on the eye or pin of the block when lifting the nominal safe working load defined in WAC 296-304-17011 (1)(a) below. The proof load is, therefore, equal to four times the safe working load as defined in WAC 296-304-17011 (1)(a) below or twice the safe working load as defined in WAC 296-304-17011 (1)(b) below.

(a) The nominal safe working load of a single-sheave block should be the maximum load which can be safely lifted by the block when the load is attached to a rope which passes around the sheave of the block.

(b) In the case of a single-sheave block where the load is attached directly to the block instead of to a rope passing around the sheave, it is permissible to lift a load equal to twice the nominal safe working load of the block as defined in WAC 296-304-17011 (1)(a) above.

(c) In the case of a lead block so situated that an acute angle cannot be formed by the two parts of the rope passing over it (i.e., the angle is always 90° or more), the block need not have a greater nominal safe working load than one-half the maximum resultant load which can be placed upon it.

(2) In cases where persons accredited to carry out loose gear tests may be retained to conduct tests of special stevedoring gear as described in WAC 296-56-45001(2), which does not form part of a vessel's equipment, such tests shall adhere to the requirements set forth in WAC 296-56-45001 (2)(a), (b) and (c).

(3) After being tested as required by WAC 296-304-17011(1), and before being taken into use, all chains, rings, hooks, shackles, blocks or other loose gear, except as noted in WAC 296-304-17013, shall be thoroughly examined, the sheaves and pins of the blocks being removed for this purpose, to determine whether any part has been injured or permanently deformed by the test. Shell bolt nuts shall be securely locked upon reassembly. Defective loose gear components shall be replaced before the certificate is issued.

(4) Any certificate relating to shackles, swivels or strength members of single-sheave blocks which have been restored to original dimensions by welding shall state this fact.

[Order 74-25, § 296-304-17011, filed 5/7/74.]

WAC 296-304-17013 Specially designed blocks and components. (1) Blocks and connecting components of an unusual nature which are specially designed and constructed as an integral part of a particular lifting unit and are either permanently affixed or of such design that two or more com-

ponents must be tested together need not be considered as loose gear for purposes of WAC 296-304-17011.

(2) In lieu of the loose gear proof test required by WAC 296-304-17011(1), design data shall be submitted to an accredited certification agency indicating design and material specifications and analysis whereby the designed strength of such gear may be determined.

(3) Subsequent to the test of the lifting unit as a whole, a thorough visual examination shall be made of disassembled parts and an electronic, ultrasonic, or other equally efficient nondestructive examination shall be made of those parts not dismantled to ensure the safe condition of such parts.

[Order 74-25, § 296-304-17013, filed 5/7/74.]

WAC 296-304-17015 Proof tests—Wire rope. Wire rope, except as provided in WAC 296-304-16003(2), shall be tested by sample, a piece being tested to destruction, and the safe working load of running ropes, unless otherwise acceptable to the department of labor and industries on the basis of design, shall not exceed one-fifth of the breaking load of the sample tested. In the case of running ropes used in gear with a safe working load exceeding 10 tons, the safe working load shall not exceed one-fourth of the breaking load of the sample tested.

[Order 74-25, § 296-304-17015, filed 5/7/74.]

WAC 296-304-17017 Proof tests after repairs or alterations. When proof loads are applied after repairs or alterations, all parts of the assembled gear shall be examined as required in WAC 296-304-17009, 296-304-17011(3), or 296-304-17013(c), whichever is applicable.

[Order 74-25, § 296-304-17017, filed 5/7/74.]

WAC 296-304-17019 Order of tests. When both unit and loose gear proof load tests are required, the loose gear test may be carried out after completion of the unit test.

[Order 74-25, § 296-304-17019, filed 5/7/74.]

WAC 296-304-17021 Heat treatment. (1) The annealing of wrought iron gear required by this section shall be accomplished at a temperature between 1100° and 1200°F, and the exposure shall be of between thirty and sixty minutes duration. After being annealed, the gear shall be allowed to cool slowly and shall then be carefully inspected. All annealing shall be carried out in a closed furnace.

(2) When heat treatment of loose gear made of other than wrought iron or steel is recommended by the manufacturer, it shall be carried out in accordance with the specifications of the manufacturer.

[Order 74-25, § 296-304-17021, filed 5/7/74.]

WAC 296-304-17023 Competent persons. All gear certification functions shall be performed by competent persons as set forth in the following table:

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Functions

Competent person

Any testing, examination, inspection, or heat treatment required in United States ports.

Responsible individual, surveyor or other authorized agent of a person accredited by the department of labor and industries under the regulations contained in this part.

Any testing, examination, inspection, or heat treatment required to be performed while the vessel is in other than United States ports.

Responsible individual, surveyor or other authorized agent of persons recognized by the Commandant of the United States Coast Guard or by a foreign nation whose certification is accepted by the department of labor and industries as being in substantial accordance with WAC 296-304-15005(1).

Testing, examination and inspection of loose gear or wire rope; heat treatment of loose gear.

Employees or authorized agents of persons accredited specifically by the department of labor and industries for this purpose under the regulations contained in this section, or the manufacturer of the gear concerned unless disapproved by the director.

[Order 74-25, § 296-304-17023, filed 5/7/74.]

WAC 296-304-180 Accreditation to certificate shore-based equipment—Scope and application. All sections of this chapter which include WAC 296-304-180 in the section number apply to accreditation to certificate shore-based equipment.

[Order 74-25, § 296-304-180, filed 5/7/74.]

WAC 296-304-18001 Eligibility for accreditation to certificate shore-based material handling devices covered by chapter 296-56 WAC of the safety and health regulations for longshoring. (1) A person applying for accreditation to carry out certification activities and to issue and maintain the requisite records must be:

(a) A manufacturer of cranes or derricks or of specialized equipment of the type for which accreditation application is made, or a person or organization representing such a manufacturer in a technical capacity; or

(b) Technically experienced and qualified to carry out examinations and/or testing, as applicable, of vessels or shore-based equipment or gear of the type for which accreditation application is made.

(2) The owner of shore-based equipment affected may designate a member of his organization to carry out certification functions respecting the owner's equipment, on the following conditions:

(a) The designee is technically experienced and qualified in the inspection and maintenance or design of the type of equipment involved, aside from employment as an operator only.

(b) The designee has applied to an accredited, nationally operating certification agency and has been granted appointment or equivalent recognition by that agency as a surveyor for the purpose intended.

(c) Certification activities carried out by the designee are cleared through the offices, and are subject to the approval, of the accredited certifying agency. When equipment is found satisfactory for use upon any survey, said equipment may be used pending receipt of notification of such approval or any disapproval.

(d) In cases where equipment is certificated by a person designated by the equipment owner, the cognizant accredited certification agency retains the right to inspect such equipment as desired and convenient, in order to ascertain the adequacy of the certification activity performed.

(3) Accreditation to conduct such nondestructive examination as may be a part of any certification activity may be granted to applicants found competent and equipped to carry out this activity.

(4) Unless exemptions are granted at the discretion of the director in cases of practical difficulties or unnecessary hardship, applicants for accreditation as specified in this section shall be prepared to carry out all necessary functions, except that any requisite wire rope tests, nondestructive examinations, and heat treatments may be carried out by the manufacturer of the gear concerned or by another person accredited specifically for these purposes.

(5) A person applying for accreditation shall have a satisfactory record of relevant experience and performance.

[Order 74-25, § 296-304-18001, filed 5/7/74.]

WAC 296-304-18003 Provisions respecting application for accreditation, action upon the application, and related matters. The provisions of WAC 296-304-14001, 296-304-14003, 296-304-14005, 296-304-14009, 296-304-14011 and 296-304-14013 shall govern accreditation to certificate shore-based material handling devices, to the extent applicable.

[Order 74-25, § 296-304-18003, filed 5/7/74.]

WAC 296-304-190 Duties of persons accredited to certificate shore-based material handling devices—General duties, exemptions. The requirements of WAC 296-304-200 through 296-304-20025 shall be strictly observed: *Provided, however,* That in cases of practical difficulties or unnecessary hardship, the director in his discretion may grant exemptions or variations from any provision in that section.

[Title 296 WAC—p. 2448]

(1) Except as otherwise noted in this section, all functions required by WAC 296-304-200 through 296-304-20025 shall be carried out by or under the supervision of a person accredited for the purpose or by his authorized representative.

(2) All required unit proof load tests shall be carried out by the use of weights as a dead load. Only where this is not possible may dynamometers or other recording test equipment be used. Any such recording test equipment owned by an accredited person shall have been tested for accuracy within the 6 months next preceding application for accreditation or renewal thereof. Such test shall be performed with calibrating equipment which has been checked in turn so that indications are traceable to the U.S. Bureau of Standards. A copy of test reports shall accompany the accreditation application. Where test equipment is not the property of the accredited person, that person shall not issue any certificate based upon the use of such equipment unless its owner has made available a certificate of accuracy based on the requirements of this section, obtained within the year prior to such use, and stating the errors of the equipment. In any event reasonable standards of accuracy shall be met and proof loads adjusted as necessary.

(3) The qualifications of any person appointed or recognized by any accredited person for the purpose of carrying out certification functions shall meet with the approval of the director.

(4) WAC 296-304-15001 (5) and (7) and 296-304-15003 shall govern, to the extent applicable, persons accredited under WAC 296-304-180 through 296-304-18003.

[Order 74-25, § 296-304-190, filed 5/7/74.]

WAC 296-304-200 Certification of shore-based material handling devices—Scope and application. All sections of this chapter which include WAC 296-304-200 in the section number apply to certification of shore-based material handling devices.

[Order 74-25, § 296-304-200, filed 5/7/74.]

WAC 296-304-20001 General provisions. (1) Certification of shore-based material handling devices shall conform to the requirements contained in this section, except in cases for which exemptions or variations have been granted by the director as provided in WAC 296-304-18001(4) and 296-304-19001(1).

(2) Any replacements or repairs deemed necessary by the accredited person shall be carried out before application of a proof test.

(3) "Ton" in this section means a ton of 2,000 pounds.

(4) When applied to shore-based material handling devices, ratings may be stated in pounds rather than tons. When stated in tons of 2,000 pounds, this fact shall be indicated.

[Order 74-25, § 296-304-20001, filed 5/7/74.]

WAC 296-304-20003 Unit proof test and examination of cranes. (1) Unit proof tests of cranes shall be carried out at the following times:

(a) In the cases of new cranes, before initial use and every 4 years thereafter.

(b) In the cases of uncertificated cranes which have been in use, at the time of initial certification and every 4 years thereafter.

(c) After important alterations and renewals, and after repairs due to failure of, or damage to, major components.

(2) Unit proof load tests of cranes shall be carried out where applicable with the boom in the least stable direction relative to the mounting, based on the manufacturer's specifications.

(3) Unit proof load tests shall be based on the manufacturer's load ratings for the conditions of use and shall, except in the case of bridge type cranes utilizing a trolley, consist of application of a proof load of 10 percent in excess of the load ratings at maximum and minimum radius, and at such intermediate radii as the certifying authority may deem necessary in the circumstances.¹ Trolley equipped cranes shall be subject to a proof load of 25 percent in excess of the manufacturer's load rating. In cases of foreign manufacture, the manufacturer's specifications shall be subject to approval by the certifying authority as being equivalent to U.S. practice.

¹ The manufacturer's load ratings are usually based upon percentage of tipping loads under some conditions and upon limitations of structural competence at others, as well as on other criteria such as type of crane mounting, whether or not outriggers are used, etc. Some cranes utilizing a trolley may have only one load rating assigned and applicable at any outreach. It is important that the manufacturer's ratings be used.

The weight of all auxiliary handling devices such as, but not limited to, magnets, hooks, slings, and clamshell buckets shall be considered part of the load.

(4) An examination shall be carried out in conjunction with each unit proof load test. The accredited person, or his authorized representative, shall make a determination as to correction of deficiencies found. The examination shall cover the following points as applicable:

(a) All functional operating mechanisms shall be examined for improper function, maladjustment, and excessive component wear, with particular attention to sheaves, pins, and drums. The examination shall include operation with partial load, in which all functions and movements, including, where applicable, maximum possible rotation in both directions, are performed.

(b) All safety devices shall be examined for malfunction.

(c) Lines, tanks, valves, drains, pumps, and other parts of air or hydraulic systems shall be examined for deterioration or leakage.

(d) Loose gear components, such as hooks, including wire rope and wire rope terminals and connections, shall be checked with particular attention to sections of wire rope exposed to abnormal wear and to sections not normally exposed for examination. The provisions of WAC 296-304-16023 shall apply in wire rope examinations. Cracked or deformed hooks shall be discarded and not reused on any equipment subject to the provisions of chapter 296-56 WAC longshoring and WAC 296-304-130 through 296-304-13503.

(e) Rope reeving shall comply with manufacturer's recommendations.

(f) Deformed, cracked, or excessively corroded members in crane structure and boom shall be repaired or replaced as necessary.

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(g) Loose bolts, rivets, or other connections shall be corrected.

(h) Worn, cracked, or distorted parts affecting safe operation shall be corrected.

(i) Brake and clutch system parts, linings, pawls, and ratchets shall be examined for excessive wear and free operation.

(j) Load, boom angle, or other indicators shall be checked over their full range for any significant inaccuracy. A boom angle or radius indicator shall be fitted.

(k) It shall be ascertained that there is a durable rating chart visible to the operator, covering the complete range of the manufacturer's capacity ratings at all operating radii, for all permissible boom lengths and jib lengths, with alternate ratings for optional equipment affecting such ratings. Necessary precautions or warnings shall be included. Operating controls shall be marked or an explanation of controls shall be posted at the operator's position to indicate function.

(l) Where used, clamshell buckets or other similar equipment such as magnets, etc., shall be carefully examined in all respects, with particular attention to closing line wires and sheaves. The accredited person may supplement such examination by requesting any operational tests as may be appropriate.

(m) Careful examination of the junction areas of removable boom sections, particularly for proper seating, cracks, deformities, or other defects in securing bolts and in the vicinity of such bolts.

(n) It shall be ascertained that no counterweights in excess of the manufacturer's specifications are fitted.

(o) Such other examination or supplemental functional tests shall be made as may be deemed necessary by the accredited person under the circumstances.

[Order 74-25, § 296-304-20003, filed 5/7/74.]

WAC 296-304-20005 Annual examination of cranes.

(1) In any year in which no quadrennial unit proof test is required, an examination shall be carried out by an accredited person or his authorized representative. Such examination shall be made not later than the anniversary date of the quadrennial certification and shall conform with the requirements of WAC 296-304-20003(4).

[Order 74-25, § 296-304-20005, filed 5/7/74.]

WAC 296-304-20007 Unit proof test and examination of derricks.

(1) Unit proof tests of derricks shall be carried out at the same times as are specified in WAC 296-304-20003 (1) for cranes.

(2) Unit proof load tests and safe working load ratings shall be based on the design load ratings at the ranges of boom angles or operating radii. Unit proof loads shall exceed the safe working load as follows:

Safe working load	Proof load
Up to 20 tons	25 percent in excess.
20-50 tons	5 tons in excess.
Over 50 tons	10 percent in excess.

Proof loads shall be applied at the designed maximum and minimum boom angles or radii, or, if this is impracticable, as close to these as practicable. The angles or radii of test shall be stated in the certificate of test. Proof loads shall be

swung as far as possible in both directions. The weight of all auxiliary handling devices shall be considered a part of the load.

(3) After satisfactory completion of a unit proof load test the derrick and all component parts thereof shall be carefully examined in accordance with the requirements of WAC 296-304-20003(4), as far as applicable.

[Order 74-25, § 296-304-20007, filed 5/7/74.]

WAC 296-304-20009 Annual examination of derricks. (1) In any year in which no quadrennial unit proof test is required, an examination shall be carried out by an accredited person or his authorized representative. Such annual examination shall be made not later than the anniversary date of the quadrennial certification and shall conform in all applicable respects with WAC 296-304-20003(4).

[Order 74-25, § 296-304-20009, filed 5/7/74.]

WAC 296-304-20011 Determination of crane or derrick safe working loads and limitations in absence of manufacturer's data. (1) In the event neither manufacturer's data nor design data on safe working loads (including any applicable limitations) are obtainable, the safe working load ratings assigned shall be based on the owner's information and warranty that those so assigned are correct. Unit test certificates shall state the basis for any such safe working load assignment.

[Order 74-25, § 296-304-20011, filed 5/7/74.]

WAC 296-304-20013 Safe working load reduction. (1) If the operation in which equipment is engaged never utilizes more than a fraction of the safe working load rating, the owner of such equipment may, at his option, have the crane or derrick certificated for and operated at a lesser maximum safe working load in keeping with the use and based on radius and other pertinent factors: *Provided, however,* That the equipment concerned is physically capable of operation at the original load rating and the load reduction is not for the purpose of avoiding correction of any deficiency.

[Order 74-25, § 296-304-20013, filed 5/7/74.]

WAC 296-304-20015 Safe working load increase. (1) In no case shall safe working loads be increased beyond the manufacturer's ratings or original design limitations unless such increase meets with the manufacturer's approval. Where the manufacturer's services are not available, or where the equipment is of foreign manufacture, engineering design analysis by, or acceptable to, the accredited certification agency is required. All necessary structural changes shall be carried out.

[Order 74-25, § 296-304-20015, filed 5/7/74.]

WAC 296-304-20017 Nondestructive examination. (1) Wherever it is considered necessary by the accredited person or his authorized representative and wherever it is practical and advisable to avoid disassembly of equipment, removal of pins, etc., examination of structure or parts by electronic ultrasonic or other nondestructive methods may be carried out, provided that the procedure followed is accept-

able to the director and the person carrying out such examination is accredited or acceptable to the director for the purpose.

[Order 74-25, § 296-304-20017, filed 5/7/74.]

WAC 296-304-20019 Wire rope. (1) Wire rope and replacement wire rope shall be of the same size, same or better grade, and same construction as originally furnished by the equipment manufacturer or contemplated in the design, unless otherwise recommended by the equipment or the wire rope manufacturer due to actual working condition requirements. In the absence of specific requirements as noted, wire rope shall be of a size and construction suitable for the purpose, and a safety factor of 4 shall be adhered to, and verified by wire rope test certificate.

(2) Wire rope in use on equipment previously constructed and prior to initial certification of said equipment shall not be required to be tested but shall be subject to thorough examination at the time of initial certification of the equipment.

[Order 74-25, § 296-304-20019, filed 5/7/74.]

WAC 296-304-20021 Heat treatment. (1) Wherever heat treatment of any loose gear is recommended by the manufacturer, it shall be carried out in accordance with the specifications of the manufacturer.

[Order 74-25, § 296-304-20021, filed 5/7/74.]

WAC 296-304-20023 Examination of bulk cargo loading or discharging spouts or suckers. (1) Those portions of bulk cargo loading or discharging spouts or suckers which extend over vessels, together with any portable extensions, rigging components, outriggers, and attachment points, supporting them or any of their components vertically, shall be examined annually. The examination shall be carried out with particular attention to the condition of wire rope and accessories. The equipment shall not be considered satisfactory unless, in the opinion of the accredited person or his authorized representative, it is deemed fit to serve its intended function.

[Order 74-25, § 296-304-20023, filed 5/7/74.]

WAC 296-304-20025 Documentation. (1) Documents issued respecting a certification function by an accredited person shall be on forms approved for such use by the director and shall so state.

(2) Such documents shall be issued by the accredited person to the owners of affected equipment, attesting to satisfactory compliance with applicable requirements. The forms used shall contain the following information:

(a) Unit proof tests where required—

(i) Identification of crane or derrick including manufacturer, model number, serial number, and ownership.

(ii) Basis for assignment of safe working load ratings, with the ratings assigned (i.e., whether based on manufacturer's ratings, whether for any specific service, etc.).

(iii) Proof test details noting radii and proof loads, how applied, and, where applicable, direction relative to mounting.

(iv) A statement that the test and associated examination were conducted and all applicable requirements of this section are met.

(v) Any necessary remarks or supplementary data, including limitations imposed and the reason therefor.

(vi) Name of accredited person and identification of authorized representative actually conducting test and/or examination.

(vii) Authorized signature of accredited person, date and place of test and/or examination.

(b) Annual examination of cranes or derricks—

(i) Information specified in WAC 296-304-20025 (2)(a)(i), (v), (vi) and (vii).

(ii) A statement that the required examination has been carried out and that, in the opinion of the accredited person or his authorized representative, the equipment has been found in compliance in all applicable respects with the requirements of this section.

(c) Annual examination of bulk cargo loadings or discharging spouts or suckers—

(i) Specific identification of equipment.

(ii) A statement that examination has been completed and that, in the opinion of the accredited person or his authorized representative, the equipment meets the criteria of WAC 296-304-20023(1).

(iii) Information specified in WAC 296-304-20025 (2)(a)(i), (v), (vi) and (vii).

(3) Certificates relating to wire rope, whether tested by or under the supervision of the accredited person or by its manufacturer and whether or not issued on the basis of the manufacturer's certificates, shall follow the general format of a wire rope test form approved by the director.

(4) Accredited persons shall advise owners of affected equipment of the necessity for maintaining required documentation or acceptable copies thereof available for inspection at or near the worksite of the equipment involved.

(a) Where initial and periodic tests as well as annual examinations are required, documentation available for inspection shall include the latest unit test certificate and any subsequent annual examination certificates, together with wire rope test certificates relating to any replacements since the last unit test or annual examination.

(b) Where only annual examination is required, documentation available for inspection shall include the latest annual examination certificate and wire rope test certificates relating to any wire replaced since the last annual examination.

(c) In the event that heat treatment of any loose gear is recommended by its manufacturer, the latest heat treatment certificate, attesting to compliance with the manufacturer's specifications, shall be part of the available documentation.

(5) No certification shall be issued until any deficiencies considered by the accredited person to constitute a currently unsatisfactory condition have been corrected. Replacement parts shall be of equal or better quality as original equipment and suitable for the purpose. In the event deficiencies remain uncorrected and no certification therefore is issued, the accredited person shall inform of the circumstances the nearest district office of the department of labor and industries.

[Order 74-25, § 296-304-20025, filed 5/7/74.]

(1999 Ed.)

Chapter 296-305 WAC

SAFETY STANDARDS FOR FIRE FIGHTERS

WAC

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DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-305-001	Foreword. [Order 77-20, § 296-305-001, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
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296-305-003	Effective date. [Order 77-20, § 296-305-003, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.		
296-305-005	Scope and application. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-005, filed 11/30/83. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 78-09-092 (Order 78-16), § 296-305-005, filed 8/31/78; Order 77-20, § 296-305-005, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-06009	Body protection. [Statutory Authority: Chapter 49.17 RCW. 91-11-070 (Order 91-01), § 296-305-06009, filed 5/20/91, effective 6/20/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06009, filed 11/30/83; Order 77-20, § 296-305-06009, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-007	Definitions. [Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-007, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-007, filed 11/30/83; Order 77-20, § 296-305-007, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-06011	Head protection. [Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06011, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06011, filed 11/30/83; Order 77-20, § 296-305-06011, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-010	Variance and procedure. [Order 77-20, § 296-305-010, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-063	Respiratory equipment. [Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-305-063, filed 11/22/91, effective 12/24/91; 88-14-108 (Order 88-11), § 296-305-063, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-063, filed 11/30/83; Order 77-20, § 296-305-063, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-015	Injury and illness report for fire fighters. [Statutory Authority: Chapter 49.17 RCW. 90-17-051 (Order 90-10), § 296-305-015, filed 8/13/90, effective 9/24/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-015, filed 11/30/83; Order 77-20, § 296-305-015, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-06301	Respiratory equipment effective dates. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06301, filed 11/30/83; Order 77-20, § 296-305-06301, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
296-305-017	Accident investigation. [Order 77-20, § 296-305-017, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-06303	Respiratory equipment approvals. [Order 77-20, § 296-305-06303, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
296-305-020	Accident prevention programs. [Order 77-20, § 296-305-020, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-06305	Respiratory equipment inspection. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06305, filed 11/30/83; Order 77-20, § 296-305-06305, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
296-305-025	Management's responsibility. [Statutory Authority: Chapter 49.17 RCW. 94-16-145, § 296-305-025, filed 8/3/94, effective 9/12/94; 91-24-017 (Order 91-07), § 296-305-025, filed 11/22/91, effective 12/24/91; 89-11-035 (Order 89-03), § 296-305-025, filed 5/15/89, effective 6/30/89; Order 77-20, § 296-305-025, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-06307	Respiratory equipment testing. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06307, filed 11/30/83; Order 77-20, § 296-305-06307, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
296-305-030	Employee's responsibility. [Order 77-20, § 296-305-030, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-06309	Respiratory protection equipment maintenance and repair. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06309, filed 11/30/83; Order 77-20, § 296-305-06309, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
296-305-035	Safe place standards. [Order 77-20, § 296-305-035, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-06311	Respiratory equipment training. [Order 77-20, § 296-305-06311, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
296-305-040	First-aid training and certification. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-040, filed 11/30/83; Order 77-20, § 296-305-040, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-06313	Filling air cylinders. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06313, filed 11/30/83.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
296-305-045	First-aid kits. [Order 77-20, § 296-305-045, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.	296-305-064	Fire overhaul. [Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-064, filed 7/6/88.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
296-305-060	Personal protective equipment and clothing. [Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-060, filed 7/6/88. Statutory Authority:		

- 296-305-065 Requirements for fire stations. [Order 77-20, § 296-305-065, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
- 296-305-070 Automotive fire apparatus. [Order 77-20, § 296-305-070, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
- 296-305-075 Fire service equipment. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-075, filed 11/30/83; Order 77-20, § 296-305-075, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
- 296-305-080 Testing fire service equipment. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-080, filed 11/30/83; Order 77-20, § 296-305-080, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
- 296-305-085 Fire combat training. [Order 77-20, § 296-305-085, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
- 296-305-090 Operations. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-090, filed 11/30/83; Order 77-20, § 296-305-090, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
- 296-305-095 Fire overhaul. [Order 77-20, § 296-305-095, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
- 296-305-9901 Testing extension ladders—Figure 14. [Order 77-20, Illustration (codified as WAC 296-305-9901), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9902 Testing extension ladders—Figure 15. [Order 77-20, Illustration (codified as WAC 296-305-9902), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9903 Testing extension ladders—Illustration. [Order 77-20, Illustration (codified as WAC 296-305-9903), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9904 Testing extension ladders—Illustration. [Order 77-20, Illustration (codified as WAC 296-305-9904), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9905 Testing extension ladders—Illustration. [Order 77-20, Illustration (codified as WAC 296-305-9905), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9906 Testing extension ladders—Illustration. [Order 77-20, Illustration (codified as WAC 296-305-9906), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-100 Ladders. [Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-100, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-100, filed 11/30/83; Order 77-20, § 296-305-100, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97.
- 296-305-105 Aerial ladders. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-105, filed 11/30/83; Order 77-20, § 296-305-105, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
- 296-305-110 Elevated platforms. [Statutory Authority: Chapter 49.17 RCW. 91-03-044 (Order 90-18), § 296-305-110, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-110, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.
- 296-305-115 Electrical. [Order 77-20, § 296-305-115, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 96-11-067, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060.

WAC 296-305-01001 Foreword. These fire fighter safety and health standards were adopted by the department of labor and industries in accordance with the provisions of the Washington Industrial Safety and Health Act (WISHA) of 1973 (chapter 49.17 RCW), with recommendations from the fire service advisory committee.

The purpose of this chapter is to assist employers and employees in the reduction of work related injuries and illnesses. In addition to providing an enforceable set of safety and health standards for the fire protection services, it is the intent of the department that the provisions of this chapter be used to assist both employers and employees in achieving the safest workplace reasonably attainable under the conditions to which employees are or will be exposed.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01001, filed 5/10/96, effective 1/1/97.]

WAC 296-305-01002 Effective date. Unless a particular provision of this chapter specifies otherwise, the effective date of chapter 296-305 WAC, shall be January 1, 1997.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01002, filed 5/10/96, effective 1/1/97.]

WAC 296-305-01003 Scope and application. (1) The rules of this chapter shall apply with respect to any and all activities, operations and equipment of employers and employees involved in providing fire protection services which are subject to the provisions of the Washington Industrial Safety and Health Act of 1973 (chapter 49.17 RCW).

(2) The provisions of this chapter apply to all fire fighters and their work places, including the fire combat scene. Although enforcement of applicable standards will result from provable violations of these standards at the fire combat scene, agents of the department will not act in any manner that will reduce or interfere with the effectiveness of the emergency response of a fire fighting unit. Activities directly related to the combating of a fire will not be subjected to the immediate restraint provisions of RCW 49.17.130.

(3) In the development of this document many consensus standards of the industry were considered and evaluated as to adaptability to the Washington state fire service industry. Where adaptable and meaningful, the fire fighter safety elements of these standards were incorporated into this WAC.

Chapter 296-305 WAC, shall be considered as the fire fighter safety standards for the state of Washington.

(4) The provisions of this chapter cover existing requirements that apply to all fire departments. All fire departments shall have in place their own policy statement and operating instructions that meet or exceed these requirements. This chapter contains state and/or federal performance criteria that fire departments shall meet.

(5) Unless specifically stated otherwise by rule, if a duplication of regulations, or a conflict exists between the rules regulating wildland fire fighting and other rules in the chapter, only the rules regulating wildland fire fighting shall apply to wildland fire fighting activities and equipment.

(6) The provisions of this chapter shall be supplemented by the provisions of the general safety and health standards of the department of labor and industries, chapters 296-24 (including Part G-2, Fire protection) and 296-62 WAC. In the event of conflict between any provision(s) of this chapter and any provision(s) of the general safety and health standards, the provision(s) of this chapter shall apply.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01003, filed 5/10/96, effective 1/1/97.]

WAC 296-305-01005 Definitions. Unless the context indicates otherwise, words used in this chapter shall have the meaning given in this section.

Accident: An unexpected event that interrupts or interferes with the orderly progress of the fire department operations and may or may not include personal injury or property damage.

Accountability system: A system of fire fighter accountability that provides for the tracking and inventory of all members.

ACGIH: American Conference of Governmental Industrial Hygienists.

Aerial ladder: A ladder mounted on top of an apparatus, hydraulic or pneumatic controlled.

Aerial tower: Telescopic elevating platform or water tower assembly usually with a ladder on top of the section.

Aerial platform: A device consisting of two or more booms or sections with a passenger carrying platform assembly.

ANSI: American National Standards Institute.

Apparatus: A mobile piece of fire equipment such as a pumper, aerial, tender, automobile, etc.

Approved:

(1) A method, equipment, procedure, practice, tool, etc., which is sanctioned, consented to, confirmed or accepted as good or satisfactory for a particular purpose or use by a person, or organization authorized to make such a judgment.

(2) Means approved by the director of the department of labor and industries or his/her authorized representative: *Provided, however,* That should a provision of this chapter state that approval by an agency or organization other than the department of labor and industries is required, such as Underwriters' Laboratories or the Bureau of Mines, the provisions of chapter 296-24 WAC, Part A-1, shall apply.

Audiogram: A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

Authorized person: A person approved or assigned by the employer to perform a specific type of duty or duties or to be at a specific location or locations at the job site.

Beacon: A flashing or rotating light.

Bloodborne pathogens: Pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

Blowup (wildfire): Sudden increase in fire intensity or rate of spread sufficient to preclude direct control or to upset existing control plans. Often accompanied by violent convection and may have other characteristics of a fire storm.

Chemical-protective clothing: Items made from chemical-resistive materials, such as clothing, hood, boots, and gloves, that are designed and configured to protect the wearer's torso, head, arms, legs, hands, and feet from hazardous materials. Chemical-protective clothing (garments) can be constructed as a single, or multipiece, garment. The garment may completely enclose the wearer either by itself or in combination with the wearer's respiratory protection, attached or detachable hood, gloves, and boots.

Chief: The employer representative highest in rank who is responsible for the fire department's operation.

Combat scene: The site where the suppression of a fire or emergency exists.

Confinement: Those procedures taken to keep a material in a defined or local area.

Confined space: Means a space that:

- (1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- (2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and
- (3) Is not designed for continuous employee occupancy.

Containment: The actions taken to keep a material in its container (e.g. stop the release of the material or reduce the amount being released.)

Contaminated: The presence or the reasonably anticipated presence of nuisance materials foreign to the normal atmospheres, blood, hazardous waste, or other potentially infectious materials on an item or surface.

Contaminated laundry: Laundry which has been soiled with blood or other potentially infectious materials or may contain contaminated sharps.

Contamination: The process of transferring a hazardous material from its source to people, animals, the environment, or equipment, which may act as a carrier.

dba: A measure of noise level expressed as decibels measured on the "A" scale.

Deck pipe: A permanently mounted device which delivers a large stream of water.

Decontamination:

(1) The physical or chemical process of reducing and preventing the spread of contamination from persons or equipment used at a hazardous materials incident.

(2) The use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of trans-

mitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.

Department: Department of labor and industries.

Director of fire department: The chief or principle administrator of the fire department.

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

Disinfection: A procedure which inactivates virtually all recognized pathogenic microorganisms, but not necessarily all microbial forms (example: bacterial endospores) on inanimate objects.

Drill tower: A structure which may or may not be attached to the station and which is principally used for training fire fighters in fire service techniques.

Driver: A person having satisfactorily completed the fire department's "requirements of driver" of a specific piece of fire apparatus.

Emergency: A sudden and unexpected event calling for immediate action.

Emergency incident: A specific emergency operation.

Emergency medical care: The provision of treatment to, and/or transportation of, patients which may include first-aid, cardiopulmonary resuscitation, basic life support, advanced life support, and other medical procedures that occur prior to arrival at a hospital or other health care facility.

Emergency operations: Activities of the fire department relating to rescue, fire suppression, emergency medical care, and special operations, including response to the scene of an incident and all functions performed at the scene.

Employee: An employee of an employer who is employed in the business of his/her employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an independent contract the essence of which is their personal labor for an employer under this chapter whether by way of manual labor or otherwise. Also see "Member."

Employer: Any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees or who contracts with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities, and all municipal corporations, public corporations, political subdivisions of the state, and charitable organizations.

Employer representative: A fire department officer authorized by the chief or director of the fire department to act in his/her behalf.

Engine (pumper): A piece of apparatus equipped with hose and a pump for the purpose of supplying water under pressure through hose lines.

Engineering control: Any procedure other than an administrative control that reduces exposures by modifying the source or reducing the exposure to an individual. Examples of engineering controls include the use of isolation, containment, encapsulation, sound absorbing materials for noise control, and ventilation.

Explosion proof equipment: Equipment enclosed in a case that is capable of withstanding an explosion or a specified gas or vapor which may occur within it and of preventing

the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and which operates at such an external temperature that it will not ignite a surrounding flammable atmosphere.

Fastest means available: The (nearest-closest) telephone, portable radio, mobile radio, telephone/radio dispatcher or any other mode of mechanical communication.

Fire apparatus: A fire department emergency vehicle used for rescue, fire suppression, or other specialized functions.

Fire boat: A fire department watercraft having a permanent, affixed fire fighting capability.

Fire combat training: Training received by fire fighters on the drill ground, drill tower, or industrial site to maintain the fire fighter's proficiency.

Fire department: An organization providing any or all of the following: Rescue, fire suppression, and other related activities. For the purposes of this standard the term "Fire Department" shall include any public, private, or military organization engaging in this type of activity.

Fire department facility: Any building or area owned, operated, occupied, or used by a fire department on a routine basis. This does not include locations where a fire department may be summoned to perform emergency operations or other duties, unless such premises are normally under the control of the fire department.

Fire department safety officer: The member of the fire department assigned and authorized as the principal safety officer to perform the duties and responsibilities specified in this standard.

Fire fighter: A member of a fire department whose duties require the performance of essential fire fighting functions or substantially similar functions.

Fire retardant: Any material used to reduce, stop or prevent the flame spread.

Fly: Extendible sections of ground or aerial ladders.

Foot stand, ladder: Devices attached to inside of beams of ladders that when folded down, provide foot space.

Ground jack: Heavy jacks attached to frame of chassis of aerial-equipped apparatus to provide stability when the aerial portion of the apparatus is used.

Ground mobile attack: The activities of wildland fire fighting with hose lines being used by personnel working around a moving engine. See mobile attack.

Guideline: An organizational directive that establishes a standard course of action.

Halyard: Rope used on extension ladders for the purpose of raising or lowering fly section(s). A wire cable may be referred to as a halyard when used on the uppermost fly section(s) of three or four section extension ladders.

Hazard communication program: A procedure to address comprehensively the issue of evaluating the potential hazards of chemicals and communicating information concerning hazards and appropriate protective measures to employees. See chapter 296-62 WAC, Part C, Hazard Communications.

Hazardous area: The immediate area where members might be exposed to a hazard.

Hazardous atmosphere: Any atmosphere, either immediately or not immediately dangerous to life or health, which

is oxygen deficient or which contains a toxic or disease-producing contaminant.

Hazardous condition: The physical condition or act which is causally related to accident occurrence. The hazardous condition is related directly to both the accident type and the agency of the accident.

Hazardous material: A substance (solid, liquid, or gas) that when released is capable of creating harm to people, the environment, and property.

Hazardous substances: Substances that present an unusual risk to persons due to properties of toxicity, chemical activity, corrosivity, etiological hazards of similar properties.

HEPA filtration: High efficiency particulate air filtration found in vacuum system capable of filtering 0.3 micron particles with 99.97% efficiency.

Hose bed: Portion of fire apparatus where hose is stored.

Hose tower: A vertical enclosure where hose is hung to dry.

Hot zone: Area immediately surrounding a hazardous materials incident, which extends far enough to prevent adverse effects from hazardous materials releases to personnel outside the zone. This zone is also referred to as the exclusion zone or the restricted zone in other documents.

Identify: To select or indicate verbally or in writing using recognized standard terms. To establish the identity of; the fact of being the same as the one described.

IDLH: Immediately dangerous to life and health.

Imminent hazard (danger): An act or condition that is judged to present a danger to persons or property and is so immediate and severe that it requires immediate corrective or preventative action.

Incident commander: The person in overall command of an emergency incident. This person is responsible for the direction and coordination of the response effort.

Incident command system (ICS): A system that includes: Roles, responsibilities, operating requirements, guidelines and procedures for organizing and operating an on-scene management structure.

Incipient (phase) fire: The beginning of a fire; where the oxygen content in the air has not been significantly reduced and the fire is producing minute amounts of water vapor, carbon dioxide, carbon monoxide and other gases; the room has a normal temperature and can be controlled or extinguished with a portable fire extinguisher or small hose, e.g., a kitchen fire.

Industrial fire brigade: An organized group of employees whose primary employment is other than fire fighting; who are knowledgeable, trained and skilled in the safe evacuation of employees during emergency situations, and in assisting in fire fighting operations.

Initial stage (initial action): Shall encompass the control efforts taken by resources which are first to arrive at an incident requiring immediate action to prevent or mitigate the loss of life or serious injury to citizenry and fire fighters.

Injury: Physical damage suffered by a person that requires treatment by a practitioner of medicine (a physician, nurse, paramedic or EMT) within one year of the incident regardless of whether treatment was actually received.

Life safety or rescue rope: Rope dedicated solely for the purpose of constructing lines for supporting people dur-

ing rescue, fire fighting, or other emergency operations, or during training evolutions.

Line: Rope when in use.

Live fire training: Any fire set within a structure, tank, pipe, pan, etc., under controlled conditions to facilitate the training of fire fighters under actual fire conditions.

Locking in: The act of securing oneself to a ladder by hooking a leg over a rung and placing top of foot against the other leg or against the ladder.

Manned station: See staffed station.

May: A permissive use or an alternative method to a specified requirement.

Member: A person involved in performing the duties and responsibilities of a fire department under the auspices of the organization. A fire department member may be a full-time or part-time employee or a paid or unpaid volunteer, may occupy any position or rank within the fire department, and engages in emergency operations. Also see Employee.

Mobile attack: The act of fighting wildland fires from a moving engine.

Monitor: A portable appliance that delivers a large stream of water.

Mop up: The act of making a wildfire/wildland fire safe after it is controlled, such as extinguishing or removing burning materials along or near the control line, felling snags, trenching logs to prevent rolling.

NFPA: National Fire Protection Association.

NIIMS: National Interagency Incident Management System.

NIOSH: National Institute of Occupational Safety and Health.

Nondestructive testing: A test to determine the characteristics or properties of a material or substance that does not involve its destruction or deterioration.

Nonskid: The surface treatment that lessens the tendency of a foreign substance to reduce the coefficient of friction between opposing surfaces.

Occupational exposure: Means reasonably anticipated skin, eye, mucous membrane or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

Officer: (1) Person in charge of a particular task or assignment.

(2) A supervisor.

OSHA: Occupational Safety and Health Administration.

Other potentially infectious materials (OPIM): (1) The following body fluids: Semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids;

(2) Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and

(3) HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

Outrigger: Manually or hydraulically operated metal enclosures and jacks which are extended and placed in con-

tact with the ground to give the apparatus a wide, solid base to support different loads.

Overhauling: That portion of fire extinguishment involving discovery of hidden fires or smoldering material.

PASS: Personal alert safety system.

PEL: Permissible exposure limit.

Personal protective equipment (PPE): (1) The equipment provided to shield or isolate a person from the chemical, physical, and thermal hazards that may be encountered at a hazardous materials incident. Personal protective equipment includes both personal protective clothing and respiratory protection. Adequate personal protective equipment should protect the respiratory system, skin, eyes, face, hands, feet, head, body, and hearing.

(2) Specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts, or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.

Place of employment: Any premises, room or other place where an employee or employees are employed for the performance of labor or service over which the employer has the right of access or control. For the purposes of this code, fireground and emergency scenes are also considered places of employment.

Platform: The portion of a telescoping or articulating boom used as a working surface.

Positive communication: Visual, audible, physical, safety guide rope, or electronic means which allows for two way message generation and reception.

PPE: Personal protective equipment.

Prefire training: The training of fire fighters in recognizing sources and locations of potential fires and the method of fire combat to be used.

Probable fatality: (1) An occupational injury or illness, which, by the doctor's prognosis, could lead to death.

(2) An occupational injury or illness, which by its very nature, is considered life threatening.

Protective clothing: Equipment designed to protect the wearer from heat and/or hazardous materials contacting the skin or eyes. Protective clothing is divided into five types:

- (1) Structural fire fighting protective clothing;
- (2) Liquid splash-protective clothing;
- (3) Vapor-protective clothing;
- (4) High temperature-protective proximity clothing; and
- (5) Wildland fire fighting clothing.

Note: See Protective ensemble.

Protective ensemble: Multiple elements of clothing and equipment designed to provide a degree of protection for fire fighters from adverse exposures to the inherent risks of structural fire fighting operations and certain other emergency operations. The elements of the protective ensemble are helmets, coats, trousers, gloves, footwear, interface components (hoods), and if applicable, personal alert system (PASS) devices, and self-contained breathing apparatus.

Pumper: See engine.

Qualified: One who by possession of a recognized degree, certificate or professional standing, or who by knowledge, training or experience has successfully demonstrated

his/her ability to solve or resolve problems related to the subject matter, the work or the project.

RCW: Revised Code of Washington.

Rescue: Those activities directed at locating endangered persons at an emergency incident and removing those persons from danger.

Rescue craft: Any fire department watercraft used for rescue operations.

Respiratory equipment: Self-contained breathing apparatus designed to provide the wearer with a supply of respirable atmosphere carried in or generated by the breathing apparatus. When in use, this breathing apparatus requires no intake of air or oxygen from the outside atmosphere.

(1) Respirators (closed circuit): Those types of respirators which retain exhaled air in the system and recondition such air for breathing again.

(2) Respirators (open circuit): Those types of respirators which exhaust exhaled air to the outside of the mask into the ambient air.

(3) Respirators (demand): Those types of respirators whose input air to the mask is started when a negative pressure is generated by inhalation.

(4) Respirators (pressure demand): Those types of respirators which constantly and automatically maintain a positive pressure in the mask by the introduction of air when the positive pressure is lowered (usually from .018 psi to .064 psi) through the process of inhalation or leakage from the mask.

Respiratory protection: Equipment designed to protect the wearer from the inhalation of contaminants. Respiratory protection is divided into three types:

(1) Positive pressure self-contained breathing apparatus (SCBA);

(2) Positive pressure airline respirators;

(3) Negative pressure air purifying respirators.

Responding: The usual reference to the act of responding or traveling to an alarm or request for assistance.

Risk assessment: To set or determine the possibility of suffering harm or loss, and to what extent.

Safe and healthful working environment: The work surroundings of an employee with minimum exposure to unsafe acts and/or unsafe conditions.

Safety officer: Either the fire department safety officer or an assistant safety officer (see fire department safety officer).

Safety net: A rope or nylon strap net not to exceed 6-inch mesh, stretched and suspended above ground level at the base of drill tower, and at such a height that a falling body would be arrested prior to striking the ground.

Scabbard: A guard which will prevent accidental injury and covers the blade and pick of an axe or other sharp instrument when worn by the fire fighter.

SCBA: Self contained breathing apparatus.

Service testing: The regular, periodic inspection and testing of apparatus and equipment according to an established schedule and procedure, to insure that it is in safe and functional operating condition.

Shall: Mandatory.

Should: Recommended.

Signalman: A person so positioned that he/she can direct the driver when the driver's vision is obstructed or obscured.

SOP: Standard operating procedure or guidelines.

Staffed station: A fire station continuously occupied by fire fighters on scheduled work shifts. The staffed station may also serve as headquarters for volunteers.

Standard operating procedure or guidelines: An organizational directive that establishes a standard course of action. See SOP.

Station (fire station): Structure in which fire service apparatus and/or personnel are housed.

Structural fire fighting: The activities of rescuing, fire suppression, and property conservation involving buildings, enclosed structures, vehicles, vessels, or similar properties that are involved in a fire or emergency situation.

Structural fire fighting protective clothing: This category of clothing, often called turnout or bunker gear, means the protective clothing normally worn by fire fighters during structural fire fighting operations. It includes a helmet, coat, pants, boots, gloves, and a hood. Structural fire fighters' protective clothing provides limited protection from heat but may not provide adequate protection from the harmful gases, vapors, liquids, or dusts that are encountered during hazardous materials incidents.

Support function: A hazardous chemical operation involving controlled chemical uses or exposures in nonflammable atmospheres with minimum threats in loss of life, personnel injury, or damage to property or to the environment. Functions include decontamination, remedial cleanup of identified chemicals, and training.

Support function protective garment: A chemical-protective suit that meets the requirements of NFPA Standard on Support Function Garments, 1993.

Tail/running board: Standing space on the side or rear of an engine or pumper apparatus.

Team: Two or more individuals who are working together in positive communication with each other through visual, audible, physical, safety guide rope, electronic, or other means to coordinate their activities and who are in close proximity to each other to provide assistance in case of emergency.

Tillerman: Rear driver of tractor-trailer aerial ladder.

Trench: A narrow excavation made below the surface of the ground. The depth is generally greater than the width, but the width of a trench is not greater than 15 feet.

Turnout clothing: See structural fire fighting protective clothing.

Turntable: The rotating surface located at the base of an aerial ladder, or boom, on aerial apparatus.

Universal precaution: An approach to infection control. According to the concept of universal precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

Vapor barrier: Material used to prevent or substantially inhibit the transfer of water, corrosive liquids and steam or other hot vapors from the outside of a garment to the wearer's body.

Variance: An allowed or authorized deviation from specific standard(s) when an employer substitutes measures which afford an equal degree of safety. Variances are issued as temporary or permanent with interim measures issued, when requested, until a determination or decision is made.

Vessel: Means every description of watercraft or other artificial contrivance used or capable of being used as a means of transportation on water, including special-purpose floating structures not primarily designed for or used as a means of transportation on water.

WAC: Washington Administrative Code.

Wheel blocks (chocks): A block or wedge placed under a wheel to prevent motion.

Wildfire: An unplanned and unwanted fire requiring suppression action; an uncontrolled fire, usually spreading through vegetative fuels and often threatening structures.

Wildland fire: A fire burning in natural vegetation that requires an individual or crew(s) to expend more than one hour of labor to confine, control and extinguish. Agencies may substitute crews to avoid the one hour benchmark or increase crew size to complete the job in less than one hour. One hour was chosen as the maximum time that individuals should work in high temperatures in structural protective clothing.

Wildland fire fighting enclosure: A fire apparatus enclosure with a minimum of three sides and a bottom.

WISHA: Washington Industrial Safety Health Act.

Work environment: The surrounding conditions, influences or forces to which an employee is exposed while working.

Workplace: See place of employment.

WRD: WISHA regional directive.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01005, filed 5/10/96, effective 1/1/97.]

WAC 296-305-01007 Variance and procedure. (1) Conditions may exist in operations that a state standard will not have practical use. The director may issue a variance from the requirements of the standard when another means of providing equal protection is provided.

(2) Applications for variances will be reviewed and investigated by the department. Variances granted shall be limited to the specific WAC code covered in the application and may be revoked for cause. The variance shall remain prominently posted on the premises while in effect.

Note: Variance forms may be obtained from the department upon request. Requests for variance from safety and health standards shall be made in writing to the assistant director, Consultation and Compliance Services Division, Department of Labor and Industries, P.O. Box 44600, Olympia, Washington 98504-4600. (Reference RCW 49.17.080 and 49.17.090.)

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 295-305-01007, filed 5/10/96, effective 1/1/97.]

WAC 296-305-01009 Appeals. Any party authorized to appeal from an action of the department as set forth in RCW 49.17.140(3), may do so by filing a notice of appeal in writing. The appeal must contain the recommended subject matter, as noted below, by serving a copy of such notice of appeal either in person or by mail upon the assistant director of the

Consultation and Compliance Services Division, (7273 Linderson Way, Tumwater, Washington) P.O. Box 44600, Olympia, Washington 98504-4600. The appeal must be sent to the department within fifteen working days of the communication of the notice.

The notice of appeal should contain:

- (1) The name and address of the appealing party and his/her representative if any;
- (2) The place where the alleged safety violation occurred;
- (3) A statement identifying the order, decision or citation appealed from, by report number and date of issuance;
- (4) The grounds upon which the appealing party considers such order, decision, or citation to be unjust or unlawful;
- (5) A statement of facts in support of each grounds stated;
- (6) The relief sought, including the specific nature and extent;
- (7) A statement that the person signing the notice of appeal has read it and to the best of his/her knowledge, information and belief there is good ground to support it. A notice of appeal may be signed by the party or by his/her authorized representative.

References:

WAC 296-350-030, Notice of appeal—Filing and service.

WAC 296-350-040, Notice of appeal—Contents RCW 49.17.140(3).

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01009, filed 5/10/96, effective 1/1/97.]

WAC 296-305-01501 Injury and illness reports for fire fighters. (1) Notice of injury or illness.

(a) Whenever an occupational accident causes injury or illness to a fire fighter or other employee, or whenever a fire fighter or other employee becomes aware of an illness apparently caused by occupational exposure, it shall be the duty of such a fire fighter or other employee, or someone on his/her behalf, to report the injury or illness to the employer before the end of his/her duty period but not later than twenty-four hours after the incident.

(b) Exception: In the event that symptoms of an occupational injury or illness are not apparent at the time of the incident, the employee shall report the symptoms to his/her employer within forty-eight hours after becoming aware of the injury or illness.

(c) Within eight hours after the fatality or probable fatality of any fire fighter or employee from a work-related incident or the inpatient hospitalization of two or more employees as a result of a work-related incident, the employer of any employees so affected, shall orally report the fatality/ multiple hospitalization by telephone or in person, to the nearest office of the department or by using the OSHA toll-free central telephone number, 1-800-321-6742.

(i) This requirement applies to each such fatality or hospitalization of two or more employees which occurs within thirty days of the incident.

(ii) Exception: If any employer does not learn of a reportable incident at the time it occurs and the incident would otherwise be reportable under this subsection, the employer shall make a report within eight hours of the time

the incident is reported to any agent or employee of the employer.

(iii) Each report required by this subsection shall relate the following information: Establishment name, location of the incident, time of the incident, number of fatalities or hospitalized employees, contact person, phone number, and a brief description of the incident.

(2) Recordkeeping - written reports; all fire service employers shall maintain records of occupational injuries and illnesses. Reportable cases include every occupational death, every occupational illness, or each injury that involves one of the following: Unconsciousness, inability to perform all phases of regular duty-related assignment, inability to work full time on duty, temporary assignment, or medical treatment beyond first-aid.

(3) All fire departments shall record occupational injury and illnesses on forms OSHA 101-Supplementary Record Occupational Injuries and Illnesses and OSHA 200-Log summary. Forms other than OSHA 101 may be substituted for the Supplementary Record of Occupational Injuries and Illnesses if they contain the same items.

(4) Each employer shall post an annual summary of occupational injuries and illnesses for each establishment. This summary shall consist of a copy of the year's totals from the Form OSHA No. 200 and the following information from that form: Calendar year covered, company name, establishment name, establishment address, certification signature, title, and date. A Form OSHA No. 200 shall be used in presenting the summary. If no injuries or illnesses occurred in the year, zeros must be entered on the totals line, and the form must be posted. The summary shall be completed by February 1 each calendar year. The summary covering the previous calendar year shall be posted no later than February 1, and shall remain in place until March 1.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01501, filed 5/10/96, effective 1/1/97.]

WAC 296-305-01503 Accident investigation. (1) After the emergency actions following accidents that cause serious injuries that have immediate symptoms, a preliminary investigation of the cause of the accident shall be conducted. The investigation shall be conducted by a person designated by the employer. The fire department shall establish a written procedure and a program for investigating, and evaluating the facts, relating to the cause of accidents. The findings of the investigation shall be documented by the employer for reference at any following formal investigations.

(2) Within eight hours after the fatality or probable fatality of any fire fighter or employee from a work-related incident or the inpatient hospitalization of two or more employees as a result of a work-related incident, the employer of any employees so affected, shall orally report the fatality/ multiple hospitalization by telephone or in person, to the nearest office of the department or by using the OSHA toll-free central telephone number, 1-800-321-6742.

(3) Equipment involved in an accident resulting in an immediate or probable fatality, shall not be moved, until a representative of the consultation and compliance services division investigates the accident and releases such equipment, except where removal is essential to prevent further

accident. When necessary to remove the victim, such equipment may be moved only to the extent of making possible such removal.

(4) Upon arrival of the department's investigator, the employer shall assign to assist the investigator such personnel as are deemed necessary by the department to conduct the investigation.

(5) The fire department shall preserve all records, photographic materials, audio, video, recordings, or other documentation concerning an accident.

Reference: WAC 296-24-020 (2), (3).

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01503, filed 5/10/96, effective 1/1/97.]

WAC 296-305-01505 Accident prevention program.

(1) All fire departments shall develop and implement a written safety program.

(2) Fire department safety programs shall have an assigned safety officer.

(3) Each employer shall develop a formal accident-prevention program, tailored to the needs of the fire department and to the type of hazards involved. The department of labor and industries' consultation and compliance services division may be contacted for assistance in developing appropriate programs.

(a) A safety orientation program describing the employer's safety program shall include:

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

(ii) How to report unsafe conditions and practices.

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

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

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

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

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

(4) Fire departments shall have a safety committee to serve in an advisory capacity to the fire chief. The number of employer-selected members shall not exceed the number of employee-elected members.

(5) The frequency of safety meetings shall be determined by the safety committee, but shall not be less than one hour per calendar quarter, however, special meetings may be held at the request of either party.

(6) Minutes shall be taken of all safety meetings. After review by the chief or his/her designee the minutes shall be conspicuously posted at all stations.

(7) Employee submitted written suggestions or complaints shall be considered. Action recommendations by the committee shall be transmitted in writing to the fire chief. The chief or his/her designated agent will reply to the submitter.

(8) Inspections of fire stations shall be made at least monthly and records maintained to ensure that stations are reasonably free of recognized hazards. These inspections

shall include, but not be limited to, tools, apparatus, extinguishers, protective equipment, and life safety equipment.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01505, filed 5/10/96, effective 1/1/97.]

WAC 296-305-01507 Fire department safety officer.

(1) The duties and responsibilities of the fire department safety officer shall include, but are not limited to:

(a) Plan and coordinate safety activities.

(b) Work closely with the safety committee.

(c) Ensure accidents are investigated.

(d) Devise corrective measures to prevent accidents.

(2) Realizing safety training and recordkeeping are management's responsibility, the fire department safety officer shall ensure the following requirements are being met:

(a) Ensure safety training for all employees.

(b) Ensure safety directives are complied with.

(c) Ensure that records are kept, but not limited to the following:

(i) Accidents

(ii) Injuries

(iii) Inspections

(iv) Exposures

(v) Medical Monitoring

(vi) Safety meetings

(vii) Apparatus

(viii) Equipment

(ix) Protective clothing

(x) Other fire department safety activities

(3) The fire department safety officer, through the fire chief, shall have the authority and responsibility to identify and recommend correction of safety and health hazards.

(4) The fire department safety officer shall maintain a liaison with staff officers regarding recommended changes in equipment, procedures, and recommended methods to eliminate unsafe practices and reduce existing hazardous conditions.

Additional Reference: NFPA 1521 Standard for Fire Department Safety Officer, may be used as a guide for duties and responsibilities relating to the safety officer.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01507, filed 5/10/96, effective 1/1/97.]

WAC 296-305-01509 Management's responsibility.

(1) It shall be the responsibility of management to establish, supervise, maintain, and enforce, in a manner which is effective in practice:

(a) A safe and healthful working environment, as it applies to noncombat conditions or to combat conditions at a fire scene after the fire has been extinguished, as determined by the officer in charge.

(b) An accident prevention program as required by this chapter.

(c) Programs for training employees in the fundamentals of accident prevention.

(d) Procedures to be used by the fire department safety officer and incident commander to ensure that emergency medical care is provided for members on duty.

(e) An accident investigation program as required by this chapter.

(2) The fire department shall be responsible for providing suitable expertise to comply with all testing requirements in this chapter. Such expertise may be secured from within the fire department, from equipment and apparatus manufacturers, or other suitable sources.

(3) Members who are under the influence of alcohol or drugs shall not participate in any fire department operations or other functions. This rule does not apply to persons taking prescription drugs as directed by a physician or dentist providing such use does not endanger the worker or others.

(4) Alcoholic beverages shall not be allowed in station houses, except at those times when station houses are used as community centers, with the approval of management.

(5) A bulletin board or posting area exclusively for safety and health and large enough to display the required safety and health posters. The WISHA poster (WISHA form F416-081-000) and other safety education material shall be provided. A bulletin board of "white background" and "green trim" is recommended.

(6) The fire department shall develop and maintain a hazard communication program as required by chapter 296-62 WAC, Part C, which will provide information to all employees relative to hazardous chemicals or substances to which they are exposed, or may routinely be exposed to, in the course of their employment.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01509, filed 5/10/96, effective 1/1/97.]

WAC 296-305-01511 Employee's responsibility. (1)

Fire fighters shall cooperate with the employer and other employees in efforts to eliminate accidents.

(2) Each fire fighter or other employee shall comply with the provisions of this chapter which are applicable to his/her own actions and conduct in the course of his/her employment.

(3) Fire fighters and other employees shall notify the appropriate employer representative of unsafe work practices and of unsafe conditions of equipment, apparatus, or work places.

(4) Fire fighters and other employees shall apply the principles of accident prevention in their work. They shall use all required safety devices, protective equipment, and safety practices, as provided and/or developed by management.

(5) Each fire fighter shall take proper care of all personal protective equipment.

(6) Fire fighters shall attend, when on duty, required training and/or orientation programs designed to increase their competency in occupational safety and health.

(7) Fire fighters who are under the influence of alcohol or drugs shall not participate in any fire department operations or other functions. This rule does not apply to persons taking prescription drugs as directed by a physician or dentist providing such use does not endanger the worker or others.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01511, filed 5/10/96, effective 1/1/97.]

WAC 296-305-01513 Safe place standards. (1) Every employer shall furnish and require the use of appropriate safety devices and safeguards. All fire fighting methods, and

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operations shall be so designed as to promote the safety and health of employees. The employer shall do everything reasonably necessary to protect the safety and health of employees.

(2) No fire fighter or other employee, employer or employer representative shall:

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

(b) Interfere in any way with the use of any safety device, method or process adopted for the protection of any employee.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01513, filed 5/10/96, effective 1/1/97.]

WAC 296-305-01515 First-aid training and certification. (1) All fire fighters except directors of fire departments and the directors' designated personnel, shall have as a minimum first-aid training as evidenced by a current, valid first-aid card, EMT or First Responder certification.

(2) New fire fighters shall have such first-aid training within 90 days of the date of their employment or enroll for training in the next available class for which they are eligible.

(3) First-aid training and certification for other employees and directors of fire departments shall conform to the requirements of chapter 296-24 WAC, Part A-1.

(4) Fire service duties include exposure to bloodborne pathogens. The requirements of this section and chapter 296-62 WAC, Part J, Biological Agents, shall apply.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01515, filed 5/10/96, effective 1/1/97.]

WAC 296-305-01517 First-aid kits. (1) To assure the emergency medical care of the fire fighters there shall be present at each emergency incident at least the following items:

- 1 (one) utility scissors, EMT-type
- 1 CPR barrier
- 3 (three) rolls 1 inch adhesive tape
- 6 (six) 4" x 4" sterile, individually wrapped gauze pads
- 4 (four) combination pads, sterile, individually wrapped
- 4 (four) soft roller bandages, assorted size, sterile, individually wrapped cling type
- 2 (two) burn sheets, sterile, individually wrapped
- 2 (two) triangular bandages
- 1 (one) multitrauma dressing, sterile
- 2 (two) supply disposable gloves
- 2 (two) wire splints or equivalent
- (2) All fire stations shall maintain a first-aid kit. The kit shall contain at least the following items:
 - 6 (six) 4" x 4" sterile, individually wrapped gauze pads
 - 4 (four) combination pads, sterile, individually wrapped
 - 2 (two) rolls 1 inch adhesive tape
 - 4 (four) soft roller bandages, assorted size, sterile, individually wrapped cling type
 - 2 (two) triangular bandages
 - 1 (one) utility scissors, EMT-type
 - 1 (one) pair tweezers
 - 1 (one) package assorted adhesive bandages

(3) All fire apparatus shall contain a first-aid kit as described in chapter 296-24 WAC, Part A-1.

(4) All fire departments providing emergency medical services to the public shall conform to the requirements of chapter 18.73 RCW Emergency Care and Transportation Services (and if applicable, chapter 248-17 WAC, Ambulance Rules and Regulations) which require additional first-aid equipment.

Additional references: Chapter 294-24 WAC, Part A-1.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-01517, filed 5/10/96, effective 1/1/97.]

WAC 296-305-02001 Personal protective equipment and protective clothing.

Note: For wildland fire fighting personal protective equipment and clothing requirements see WAC 296-305-07003, Personal protective clothing and equipment for wildland fire fighting.

(1) Employers shall provide and maintain at no cost to the employee the appropriate protective ensemble/protective clothing to protect from the hazards to which the member is or is likely to be exposed. Employers shall ensure the use of all protective equipment and clothing required by this standard. Employers shall assure that the protective clothing and equipment ordered or purchased after the effective date of this standard meets the requirements of this standard. Full protective equipment designated for the task, shall be worn for all department activities.

(2) Fire fighters shall be trained in the function, donning and doffing, care, use, inspection, maintenance and limitations of the protective equipment assigned to them or available for their use.

(3) Protective clothing and protective equipment shall be used and maintained in accordance with manufacturer's instructions. A written maintenance, repair, retirement, servicing, and inspection program shall be established for protective clothing and equipment. Specific responsibilities shall be assigned for inspection and maintenance. This requirement applies to fire fighter's personally owned equipment as well as equipment issued by the employer.

(4) The fire department shall provide for the cleaning of protective clothing and contaminated station/work uniforms at no cost to the employee. Such cleaning shall be performed by either a cleaning service, or at a fire department facility, that is equipped to handle contaminated clothing.

Note: See Appendix A.

(5) Personal protective equipment and clothing shall be of a type specified by NIOSH, MSHA, NFPA, ANSI, or as specifically referenced in the appropriate section of this chapter.

(6) Station/work uniforms. Station/work uniforms are not themselves intended as primary protective garments.

(a) Station/work uniforms if provided, shall meet the requirements as specified in NFPA 1975, 1990 edition.

(b) All station/work uniforms purchased after the effective date of this regulation shall meet the requirements set forth in this standard.

(c) Station/work uniforms include trousers, and/or coveralls, but exclude shirts, underwear, and socks.

(d) Members shall not wear any clothing that is determined to be unsafe due to poor thermal stability or poor flame resistance when engaged in or exposed to the hazards of structural fire fighting. Because it is impossible to ensure that every member will respond to an incident in a station/work uniform or will change out of fabrics that have poor thermal stability or ignite easily, before donning protective garments, the fire department shall inform members of the hazards of fabrics that melt, drip, burn, stick to the skin and cause burns to the wearer due to poor thermal stability or poor flame resistance.

(e) Garments meeting the requirements of WAC 296-305-07003(1), meet the intent of this section.

(f) Station/work uniforms purchased prior to the effective date of this chapter shall be acceptable for a period of two years or until the employers current inventory has been exhausted, whichever comes first.

(7) Turnout clothing/pants and coat:

Proximity clothing:

(a) All turnout clothing used as proximity clothing shall meet the requirements of NFPA, 1976 Standard on Protective Clothing for Proximity Fire Fighting, 1992 edition.

(b) There shall be at least a two-inch overlap of all layers of the protective coat and the protective trousers so there is no gapping of the total thermal protection when the protective garments are worn. The minimum overlap shall be determined by measuring the garments on the wearer, without SCBA, with the wearer in the most stretched position, hands together reaching overhead as high as possible.

(c) Single piece protective coveralls shall not be required to have an overlap of all layers as long as there is continuous full thermal protection.

(d) Fire departments that provide protective coats with protective resilient wristlets secured through a thumb opening may provide gloves of the gauntlet type for use with these protective coats. Fire departments that do not provide such wristlets attached to all protective coats shall provide gloves of the wristlet type for use with these protective coats.

(e) Where the SCBA is worn over or outside the proximity protective garment, the fire department shall inform the member of the potential high levels of radiant heat that may result in the failure of the SCBA. The fire department shall require additional approved radiant reflective criteria, including but not limited to a protective cover, for the expected proximity fire fighting exposures when the SCBA is worn over or outside the proximity protective garment.

(8) Structural fire fighting clothing.

(a) All turnout clothing purchased after the effective date of these regulations shall meet the requirements of NFPA, Standard on Protective Clothing for Structural Fire Fighting 1971, 1991 edition. In no case, shall fire fighters wear personal protective clothing manufactured prior to the 1986 edition, NFPA, Standard on Protective Clothing for Structural Fire Fighting 1971.

(b) Turnout clothing shall be maintained as specified by the manufacturer.

(c) Repairs to turnout clothing shall be done to the manufacturer's specification by qualified individuals approved by the manufacturer. Repairs must be made using materials and methods in accordance with the applicable standards under

which the article was produced. Repairs include any and all alterations, modifications, additions, deletions or any other change made to the manufacturers PPE article.

(d) Turnout clothing which is damaged or does not comply with this section shall not be used.

(e) All turnout clothing shall be inspected semi-annually by an individual qualified by the employer. Inspection intervals shall not exceed six months.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02001, filed 5/10/96, effective 1/1/97.]

WAC 296-305-02003 Eye and face protection. (1)

Face and eye protection shall be provided for and used by fire fighters engaged in fire suppression and other operations involving hazards to the eye and face at all times when the face is not protected by the full facepiece of the SCBA.

(2) Persons whose vision requires the use of corrective lenses in spectacles, and who are required by this standard to wear eye protection, shall wear goggles or spectacles of one of the following types:

(a) Spectacles with protective lenses that provide optical correction.

(b) Goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles.

(c) Goggles that incorporate corrective lenses mounted behind the protective lens.

(3) When limitations or precautions are indicated by the manufacturer, they shall be transmitted to the user and care taken to see such limitations and precautions are strictly observed.

(4) Care, use, and maintenance for any type of eye or face protection shall follow the manufacturers suggested recommendations.

(5) Goggles shall be inspected, cleaned and disinfected prior to being reissued to other employees.

Note: The helmet face shield alone does not always provide adequate eye protection against flying particles, splash, gases and vapors. For known eye hazards, such as, but not limited to, cutting with power saws, chopping, drilling and using extrication equipment, the face shield should be worn with additional eye protection.

(6) Helmet face shields shall meet the requirements of NFPA, Standard Helmets for Structural Fire Fighting 1972, 1992 edition.

(7) For fire fighters that do not have a helmet face shield for eye and face protection, flexible or cushioned fitting goggles shall be provided.

(8) Goggles shall consist of a wholly flexible frame, forming a lens holder or a rigid frame with integral lens or lenses, having a separate, cushioned fitting surface on the full periphery of the facial contact area.

(a) Materials used shall be chemical-resistant, nontoxic, nonirritating and slow burning.

(b) There shall be a positive means of support on the face, such as an adjustable headband of suitable material or other appropriate means of support to retain the frame comfortable and snugly in front of the eyes.

(c) Goggles shall meet the requirements of ANSI Z87.1.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02003, filed 5/10/96, effective 1/1/97.]

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WAC 296-305-02005 Hearing protection. (1) Fire departments shall administer a continuing effective hearing conservation program, as described in chapter 296-62 WAC, Part K, Hearing Conservation, except for WAC 296-62-09031 (2)(b), whenever employees noise exposure equal or exceed an eight-hour time-weighted average (TWA) sound level of 85 decibels (dBA) measured on the A scale weighing at slow response or, equivalently, a noise dose of fifty percent.

(2) For the purpose of a hearing conservation program, employee noise exposure shall be computed in accordance with WAC 296-62-09055, Appendix E, Noise exposure computation, without regard to any attenuation provided by the use of personal protective equipment.

(3) The hearing conservation program shall be provided at no cost to the employee.

(4) Hearing protection shall be provided for and used by all members when exposed to an eight-hour time weighted average of 85 dBA or greater or when exposed to noise in excess of 115 dBA from power tools, engine warm ups, drafting, or other such activities, except in situations where the use of such protective equipment would create an additional hazard to the user such as in fire suppression.

(5) Audiometric test shall be performed by a licensed or certified audiologist, otolaryngologist, or other qualified physician, or by a technician who is certified by the council of accreditation in occupational hearing conservation. A technician who performs audiometric tests must be responsible to an audiologist, otolaryngologist or other qualified physician.

(6) The fire department shall institute a hearing conservation training program for all employees and shall ensure their participation in such programs, meeting the minimum requirements specified in chapter 296-62 WAC, Part K.

(7) The use of personal protective equipment to limit noise exposure shall be considered as an interim approach until the noise levels produced by vehicles, warning devices, and radios can be reduced. Protective muffs are recommended for fire fighters, due to the difficulties of proper fit and insertion of ear plugs.

(8) Noise levels in new fire apparatus purchased after the effective date of this chapter, shall not exceed at any seated position to be a maximum of 90 dBA when measured, as specified in this section, without any warning device in operation.

(a) Interior noise levels shall be measured with the vehicle in motion at the speed that produces the highest noise level, up to 55 mph.

(b) All windows should be closed and the noise level shall be measured in each passenger area.

(c) For existing apparatus, compliance with this section will be required within two years of the effective date of this chapter.

Note: In order to reduce noise levels, the following engineering controls may achieve such a reduction:

- a. Move siren speakers and air horns down onto the front bumper.
- b. Respond with windows closed.
- c. Install sound-attenuating insulation in cabs of apparatus.
- d. Lower the pitch of siren and air horns.
- e. Improve radio equipment with higher clarity and less output volume.

(9) For existing fire apparatus that cannot be brought into compliance, the employer shall be required to provide members with hearing protectors.

(10) The fire department shall provide training in the use and care of all hearing protectors provided to employees.

(11) The training program shall be repeated annually for each employee included in the hearing conservation program.

(12) Information provided in the training program shall be updated to be consistent with changes in protective equipment and work processes.

Additional References: Chapter 296-62 WAC, Part K.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02005, filed 5/10/96, effective 1/1/97.]

WAC 296-305-02007 Hand protection. (1) Fire fighters' gloves shall when worn with turnout clothing, provide protection to the wrist area. In turnout clothing where wristlet protection is not provided fire fighters' gloves shall be closed at the top.

(2) Fire departments shall establish written policy and procedure for the care, use, cleaning, replacement and/or retirement criteria, and maintenance of gloves issued.

(3) Gloves purchased after the effective date of this chapter shall comply with this section.

(4) Fire fighters' gloves used during structural fire fighting operations including rescue of victims from fires, and emergency medical operations where sharp or rough surfaces are likely to be encountered such as victim extrications shall meet the requirements of NFPA, Standard on Gloves for Structural Fire Fighting 1973, 1993 edition.

(5) Fire fighters gloves are not designed to provide protection to all environments. For gloves desired to fill the needs of a specific requirement see that specific section of this chapter. It is the intent of this section to provide protection from intrusion throughout the glove body by certain common chemicals, and from bloodborne pathogens. Fire departments shall consult the manufacturer's recommendation.

Note: Fire fighters should have their hands sized for compliance with the sizing chart as specified in NFPA, Standard on Gloves for Structural Fire Fighting 1973, 1993 edition.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02007, filed 5/10/96, effective 1/1/97.]

WAC 296-305-02009 Body protection. (1) Body protection shall be coordinated with torso, hand, head, foot, respiratory, and face protection as outlined in WAC 296-305-02001 through 296-305-02019.

(2) Fire departments shall establish written procedures for the use of components of any or all portions of protective equipment.

(3) Fire departments that provide structural and wildfire suppression shall establish written procedures for the use of protective clothing on structural and wildfire suppression activities.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02009, filed 5/10/96, effective 1/1/97.]

WAC 296-305-02011 Body armor. Fire departments that use protective body armor shall comply with the following:

[Title 296 WAC—p. 2464]

(1) The fire department shall develop and have in place written guidelines for the care, use and maintenance of the protective body armor in conjunction with the manufacturer's recommendations.

(2) All protective body armor shall meet or exceed National Institute of Justice NIF 0101.03, Threat Level II requirements, April 1987 edition, which is incorporated by reference (or shall be demonstrated by the employer to be equally effective), for both wet and dry ballistic performance.

(3) Body armor shall be correctly fitted following the manufacturer's recommendations and shall not be used beyond the manufacturer's warranty.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02011, filed 5/10/96, effective 1/1/97.]

WAC 296-305-02013 Foot protection for structural fire fighting. (1) Protective footwear purchased after the effective date of this standard shall comply with NFPA 1974, Standard on Protective Footwear for Structural Fire Fighting, 1992 edition.

(2) Fire departments shall establish written policy and procedure, care, use, maintenance, and retirement criteria for footwear in conjunction with the manufacturer's recommendations.

Note: Fire departments should establish cleaning and drying instruction including applicable warning regarding detergents, soaps, cleaning additives and bleaches for protective footwear.

(3) Fire fighter footwear may be resoled but the footwear upon resoling shall meet the requirements specified in this section.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02013, filed 5/10/96, effective 1/1/97.]

WAC 296-305-02015 Head protection. (1) Fire fighters who engage in or are exposed to the hazards of structural fire fighting shall be provided with and use helmets that meet the requirements of NFPA 1972, Standard on Helmets for Structural Fire Fighting, 1987 edition.

(2) Helmets purchased thirty days after the adoption of this chapter shall meet the requirements of NFPA, Standard on Helmets for Structural Fire Fighting 1972, 1992 edition.

(3) Fire departments shall establish a written policy and procedure for the care, use, maintenance, and retirement criteria for helmets.

(4) Helmets shall be provided with face shields or goggles.

(5) Helmet accessories shall not interfere with the function of the helmet or its components parts and shall not degrade the helmets performance.

(6) Helmets shall be maintained in accordance with the manufacturer's recommendations. No modifications shall be made without prior written approval from the manufacturer.

(7) Fire fighters shall follow the manufacturer's recommendations regarding cleaning, painting, marking, storage, and frequency and details of inspection.

Note: Helmets should be stored at room temperature and out of direct sunlight.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02015, filed 5/10/96, effective 1/1/97.]

WAC 296-305-02017 Personal alert safety system (PASS) protection. (1) Each fire fighter working in a hazardous area requiring the use of SCBA shall wear and use a PASS device. PASS devices shall meet the requirements of NFPA, Standard on Personal Alert Safety Systems (PASS) for Fire Fighters 1982, 1993 edition. (See WAC 296-305-07001 through 296-305-07019 for wildland fire fighting application.)

(2) Each PASS device shall be tested routinely to ensure it is ready for use and immediately prior to each use, and shall be maintained in accordance with the manufacturers' instructions.

(3) Fire departments shall provide written procedures for the use of PASS devices.

(4) Compliance with this section shall occur no later than two years after the effective date of this chapter.

Note: Fire departments should provide one spare PASS device for each ten units in service. If a department has less than ten devices they should have one spare.

(5) Fire departments shall establish a written procedure for the care, use, maintenance, and repair of PASS devices in conjunction with manufacturer's recommendations.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02017, filed 5/10/96, effective 1/1/97.]

WAC 296-305-02019 Life safety ropes, harnesses, and hardware protection. (1) All life safety ropes, harnesses, and hardware used by fire departments shall meet the applicable requirements of NFPA 1983, Standard on Fire Service Life Safety Rope, Harness, and Hardware, 1990 edition.

(2) Ropes used to support the weight of members or other persons during rescue, fire fighting, other emergency operations, or during training evolutions shall be life safety rope.

(3) Life safety rope used for rescue at fires, or other emergency incidents, or for training, shall be permitted to be reused if inspected before, and after, each such use in accordance with the manufacturer's instructions and provided:

(a) The rope has not been visually damaged by the exposure to heat, direct flame impingement, chemical exposure, or abrasion.

(b) The rope has not been subjected to any impact load.

(c) The rope has not been exposed to chemical liquids, solids, gases, mists, or vapors of any materials, known to deteriorate rope.

(d) If the rope used for rescue at fires or other emergency incidents, or for training, has been subjected to (a), (b), or (c) of this section, or fails the visual inspection, it shall be destroyed after such use.

(e) If there is any question regarding the serviceability of the rope after consideration of the above, the safe course of action shall be taken and the rope shall be placed out of service. See Appendix B.

(f) Rope inspection shall be conducted by qualified inspectors in accordance with rope inspection procedures established and recommended as adequate by the rope manufacturer to assure rope is suitable for reuse.

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(4) Fire departments shall establish written procedures for the use of life safety ropes and rescue operations utilizing harnesses and ropes.

(5) Records shall provide a history of each life safety and training rope. The minimum information to be reflected in the record of history of life safety and training ropes shall include: Date of manufacturer, organization serial number, use list to include inspectors name and space for comments.

(6) Rope used for training evolutions shall be designated as training rope and shall be permitted to be reused if inspected before and after each use in accordance with the manufacturer's instructions.

(7) The destruction of a rope means that it shall be removed from service and altered in such a manner that it could not be mistakenly used as a life safety rope. This includes disposal or removal of labels and cutting into short lengths to be used for utility purposes.

(8) All repairs to life safety harnesses shall be done by an authorized manufacturer's representative, or the manufacturer.

Note: See WAC 296-305-06003 (3), (4), (5), and (6) for the testing of life belts, ropes, and harnesses.

(9) Class I safety harnesses shall be used for fire fighter attachment to ladders and aerial devices.

(10) Class II and Class III life safety harnesses shall be utilized for fall arrest and rappelling operations.

(11) Rescue ropes shall be padded when deployed over edges or rough surfaces.

Note: See WAC 296-305-05005 for rope rescue applications.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02019, filed 5/10/96, effective 1/1/97.]

WAC 296-305-02501 Emergency medical protection.

(1) Fire fighters who perform emergency medical care or otherwise may be exposed to blood or other body fluids shall be provided with emergency medical face protection devices, and emergency medical garments that meet the applicable requirements of NFPA, Standard on Protective Clothing for Emergency Medical Operations 1999, 1992 edition.

Note: Prior to purchase, fire departments should request the technical data package required in NFPA 1999, 1992 edition, in order to compare glove and garment performance data. Departments reviewing these packages should ensure a relative ranking of the performance data before they purchase in order to provide the best performance of the EMS personal protective clothing.

(2) Fire fighters shall don emergency medical gloves prior to initiating any emergency patient care.

(3) Fire fighters shall don emergency medical garments and emergency medical face protection devices prior to any patient care during which splashes of body fluids can occur such as situations involving spurting blood or childbirth.

Note: Fire fighter turnout gear and gloves with vapor barriers may be used in lieu of emergency medical gloves and garments.

(4) Contaminated emergency medical garments, emergency medical face protection, gloves, devices, and emergency medical gloves shall be cleaned and disinfected, or disposed of, in accordance with WAC 296-62-08001, Part J, Bloodborne pathogens.

(5) Fire departments shall establish a designated infection (exposure) control officer who shall ensure that an adequate infection control plan is developed and all personnel are trained and supervised on the plan.

(6) The infection control officer shall be responsible for establishing personnel exposure protocols so that a process for dealing with exposures is in writing and available to all personnel.

(7) The infection control officer or his/her designee will function as a liaison between area hospitals and fire department members to provide notification that a communicable disease exposure is suspected or has been determined by hospital medical personnel. The department infection control officer will institute the established exposure protocols immediately after report of an exposure. The infection control officer shall follow the confidentiality requirements of chapter 246-100 WAC and the medical protocol requirements of WAC 296-62-05209.

(8) Fire departments shall have a written infection (exposure) control plan which clearly explains the intent, benefits, and purpose of the plan. The written document must cover the standards of exposure control such as establishing the infection control officer and all members affected; education and training; HBV vaccination requirements; documentation and record keeping; cleaning/disinfection of personnel and equipment; and exposure protocols.

(9) Policy statements and standard operating procedure guidelines shall provide general guidance and specific regulation of daily activities. Procedures shall include delegation of specific roles and responsibilities, such as regulation of infection control, as well as procedural guidelines for all required tasks and functions.

(10) Fire departments shall establish a records system for members health and training.

(11) Fire fighters shall be trained in the proper use of PPE, exposure protection, post exposure protocols, disease modes of transmission as it related to infectious diseases.

(12) Infectious disease programs shall have a process for monitoring fire fighters compliance with established guidelines and a means for correcting noncompliance.

(13) Fire department members shall be required to annually review the infectious disease plan, updates, protocols, and equipment used in the program.

(14) Fire departments shall comply with WAC 296-62-08001, Part J, Bloodborne pathogens, in its entirety.

(15) Tuberculosis (TB) exposure and respiratory protection requirements.

(a) Fire fighters shall wear a particulate respirator (PR) when entering areas occupied by individuals with suspected or confirmed TB, when performing high risk procedures on such individuals or when transporting individuals with suspected or confirmed TB in a closed vehicle.

(b) A NIOSH-approved, 95% efficient particulate air respirator is the minimum acceptable level of respiratory protection.

(i) Fit tests are required.

(ii) Fit tests shall be done by procedures recommended by the respirator manufacturer or the department.

Note 1: Emergency-response personnel should be routinely screened for tuberculosis at regular intervals. The tubercu-

lin skin test is the only method currently available that demonstrates infection with Mycobacterium tuberculosis (M. tuberculosis) in the absence of active tuberculosis.

Note 2: If possible, the rear windows of a vehicle transporting patients with confirmed, suspected, or active tuberculosis should be kept open, and the heater or air conditioner set on a noncirculating cycle.

Additional References:

Chapter 296-62 WAC, Part J, Biological Agents-Bloodborne Pathogens.

WAC 296-62-08001(3), Exposure Control.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-02501, filed 5/10/96, effective 1/1/97.]

WAC 296-305-03001 Hazardous materials protection. (1) Structural fire fighting protective clothing shall not be used as primary protection for hazardous material incidents except as noted in the current edition of the Department of Transportation Emergency Response guidebook, which is incorporated by reference or shall be demonstrated by the employer to be equally effective.

(2) Fire departments shall use the technical data package provided by the clothing manufacturer when selecting the hazardous chemical protection.

(a) The approach to selecting personal protective clothing must encompass an ensemble of clothing items that are integrated to provide a level of protection and the ability to carry out emergency response activities.

(b) The following is a check list of components that may form the chemical protective ensemble:

(i) Protective clothing (suits, coveralls, hoods, gloves, boots)

(ii) Respiratory equipment (SCBA)

(iii) Cooling system (ice vest, air circulation, water circulation)

(iv) Head protection

(v) Inner garments

(vi) Outer protection (overgloves, overboots, flashcovers)

(3) Hazardous chemical protective equipment shall be classified by performance and for the purpose of this chapter are defined as:

(a) Vapor-Protective Suits (Level "A")

(b) Liquid Splash-Protective Suits (Level "B")

(c) Support Function Protective Suits

(4) Fire department personnel involved in hazardous materials incident shall be protected against potential chemical hazards. Chemical protective clothing shall be selected and used to protect the respiratory system, skin, eyes, face, hands, feet, head, and body.

(5) Vapor protective and liquid splash-protective suits shall completely cover both the wearer and the wearer's breathing apparatus. Wearing a SCBA or other respiratory equipment outside the suit subjects this equipment to the chemically contaminated environment, increasing possible failure potentials and decontamination problems.

(6) Fire fighters who engage in operations likely to result in significant exposure to vapors that can reasonably be presumed harmful by way of dermal exposure shall have available and make appropriate use of vapor protective suits. Vapor protective suits shall meet the requirements of NFPA, Standard on Vapor Suits for Hazardous Chemical Emergen-

cies in 1991, 1990 edition, with the single exception that suits meeting all but the flammability standard may only be worn in atmospheres verified by means of appropriate air monitoring to be at no more than 10% of the lower explosive limit (LEL).

(7) Prior to the use of vapor protective suits, liquid splash-protective suits or support function protective suits, the department shall consult the technical data package to assure that the garment is appropriate for the specific hazardous chemical emergency.

(8) Vapor protective suits and liquid splash-protective suits shall not be used alone for any fire fighting applications or for protection from radiological, biological, or cryogenic agents or in flammable or explosive atmospheres.

(9) Fire fighters who engage in operations or who are exposed to known chemicals in liquid-splash chemical environments during hazardous chemical material emergencies shall be provided with, and shall use, liquid splash-protective suits. Liquid splash-protective suits shall meet the requirements of NFPA, Standard on Liquid-Splash Protective Suits for Hazardous Chemical Emergencies 1992, 1991 edition.

(10) Liquid splash-protective suits shall not be used when operations are likely to result in significant exposure to chemicals or specific chemical mixtures with known or suspected carcinogenicity as indicated by any one of the following documents if it can reasonably be expected that fire fighters in vapor protective suits would be significantly better protected:

(a) N. Irving Sax, *Dangerous Properties of Industrial Chemicals*, current edition.

(b) NIOSH Pocket Guide to Chemical Hazards, current edition.

(c) U.S. Coast Guard Chemical Hazard Response Information System (CHRIS), Volumes 13, Hazardous Chemical Data.

(11) Liquid splash-protective suits shall not be used when operations are likely to result in significant exposure to chemicals or specific chemical mixtures with skin toxicity notations as indicated by the American Conference of Government Industrial Hygienists (ACGIH), *Threshold Limit Values and Biological Exposure Indices for 1988-1989* if it can reasonably be expected that fire fighters in vapor protective suits would be significantly better protected.

(12) Support garments shall not be used in the hot zone of any hazardous material operation.

(13) Fire fighters assigned to functional support operations outside the hot zone during hazardous chemical emergencies shall be provided with and shall use support function protective garments. Support function garments shall meet the requirements of NFPA, *Standard on Support Function Protective Garments for Hazardous Chemical Operations* 1993, 1990 edition.

(14) Support function protective garments shall not be used for protection from chemical or specific chemical mixture with known or suspected carcinogenicity as indicated by (10)(a), (b), or (c).

(15) Support function protective garments shall not be used for protection from chemicals or specific chemical mixtures with skin toxicity notations as indicated in the American Conference of Governmental Industrial Hygienists,

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Threshold Values and Biological Exposure Indices for 1988-1989.

Note: Decontamination - See Appendix C.

Additional References: WAC 296-305-05011, Hazardous materials operations.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-03001, filed 5/10/96, effective 1/1/97.]

WAC 296-305-04001 Respiratory equipment protection. (1) Fire fighter's self-contained breathing apparatus (SCBA) shall:

- (a) Be pressure demand type (positive pressure);
- (b) Operate in the positive pressure mode only;
- (c) Have a minimum of thirty minutes service duration;
- (d) Be NIOSH certified; and
- (e) Meet the requirements of NFPA, *Standard on Open Circuit Self Contained Breathing Apparatus for Fire Fighters* 1981, 1992 edition.

(2) Closed circuit SCBA shall:

- (a) Be positive pressure;
 - (b) Be NIOSH certified; and
 - (c) Have a minimum thirty-minute service duration.
- (3) Members using SCBA's shall operate in teams of two or more.

(4) Except as otherwise provided in this chapter, fire departments shall adopt and maintain a written respiratory protection program that addresses the requirements of chapter 296-62 WAC, Part E, Respiratory protection and Part I-1, Asbestos, Tremolite, Anthophyllite, and Actinolite. This includes program administration, medical limitations, equipment limitations, equipment selection, inspection, use, maintenance, training, fit testing procedures, air quality, and program evaluation.

Note: Additional information on respirators and respirator usage can be found in ANSI Z88.2 - American National Standard for Respiratory Protection; ANSI Z88.5 - Practices for Respiratory Protection for Fire Service; various NFPA publications (1981, 1404, 1500, etc.), and the Washington State Fire Service Training Program for respiratory training and usage.

(5) When fire departments purchase compressed breathing air from a vendor, the fire department shall require the vendor to provide certification and documentation of breathing air quality quarterly as specified in subsection (22) of this section.

(6) When the fire department makes its own breathing air or uses vendor purchased breathing air, the air quality from compressors, cascade systems cylinders, shall be tested at least quarterly as specified in subsection (22) of this section.

(7) Qualitative or quantitative fit testing shall be conducted.

(a) Each new member shall be tested before being permitted to use SCBA's in a hazardous atmosphere.

(b) Only fire fighters with a properly fitting facepiece shall be permitted by the fire department to function in a hazardous atmosphere with SCBA. (Reference WAC 296-62-07115(3) Respiratory Sealing Problems.)

(c) Fit testing shall be repeated:

- (i) At least once every twelve months.

(ii) Whenever there are changes in the type of SCBA or facepiece used.

(iii) Whenever there are significant physical changes in the user. Example: Weight change of ten percent or more, scarring of face seal area, dental changes, cosmetic surgery, or any other condition that may affect the fit of the facepiece seal.

(d) The fit testing is done only in a negative-pressure mode. If the facepiece is modified for fit testing, the modification shall not affect the normal fit of the device. Such modified devices shall only be used for fit testing.

(e) The fit test procedures and test exercises described in WAC 296-62-07739, Asbestos, Appendix C, shall be followed unless stated otherwise in this chapter.

(f) Respirator fit test records shall include:

(i) Written guidelines for the respirator fit testing program including pass/fail criteria;

(ii) Type of respirator tested including manufacturer, model, and size;

(iii) Type of fit test and instrumentation or equipment used;

(iv) Name or identification of test operator;

(v) Name of person tested;

(vi) Date of test; and

(vii) Results of test.

Note: Fire fighters should be issued individual facepieces.

(8) Facial hair, contact lenses, and eye and face protective devices.

(a) A negative pressure respirator, any self-contained breathing apparatus, or any respirator which is used in an atmosphere immediately dangerous to life or health (IDLH) equipped with a facepiece shall not be worn if facial hair comes between the sealing periphery of the facepiece and the face or if facial hair interferes with the valve function.

(b) The wearer of a respirator shall not be allowed to wear contact lenses if the risk of eye damage is increased by their use.

(c) If a spectacle, goggle, or face shield must be worn with a facepiece, it shall be worn so as to not adversely affect the seal of the facepiece to the face. See WAC 296-62-07115(3).

(d) Straps or temple bars shall not pass between the seal or surface of the respirator and the user's face.

(9) At the end of suppression activities (to include fire overhaul) and before returning to quarters:

(a) Fire fighters shall be decontaminated prior to removal of respirators whenever fire fighting activities resulted in exposure to a hazardous substance.

(b) When exchanging air supply bottles during suppression or overhaul activities, reasonable precautions shall be taken to maintain uncontaminated atmosphere to the breathing zone and facepiece supply hose.

(10) Self-contained respiratory equipment shall be available and used by all fire fighters who enter into hazardous atmospheres.

(a) Positive pressure air line respirators may be used only for atmospheres other than IDLH and must be equipped with a five minute minimum capacity positive pressure escape bottle.

(b) The self-contained air supply shall only be used for escape unless the service life of the air supply is greater than fifteen minutes.

(c) If the service life of the self-contained air supply is greater than fifteen minutes, it may be used to enter an IDLH atmosphere breathing from the self-contained air supply, provided that not more than twenty percent of the noted air supply is used during entry.

(11) The maximum length of hose for supplied air respirators is 300 feet (91 meters). Such hose shall be heavy duty nonkinking and NIOSH approved.

(12) Respirators shall be provided for, and shall be used by, all personnel working in areas where:

(a) The atmosphere is hazardous;

(b) The atmosphere is suspected of being hazardous; or

(c) The atmosphere may rapidly become hazardous;

(13) Anytime fire fighters are working inside a confined space, such persons shall be provided with SCBA or air line respirator with escape bottle, and shall use the equipment unless the safety of the atmosphere can be established by testing and continuous monitoring.

(14) Fire fighters using a properly functioning SCBA shall not compromise the protective integrity of the SCBA by removing the facepiece for any reason in hazardous atmospheres or in atmospheres where the quality of air is unknown.

(15) Fire fighters shall receive training for each type and manufacturer of respiratory equipment available for their use, the step-by-step procedure for donning the respirator and checking it for proper function. Required training shall include:

(a) Recognizing hazards that may be encountered;

(b) Understanding the components of the SCBA;

(c) Understanding the safety features and limitations of the SCBA; and

(d) Donning and doffing the SCBA.

(16) After completing such training, each fire fighter shall practice at least quarterly, for each type and manufacturer of respirator available for use, the step-by-step procedure for donning the respirator and checking it for proper function.

(17) Members shall be tested at least annually on the knowledge of SCBA equipment operation, safety, organizational policies and procedures, and facepiece seals, to the fire department's standard. Such records shall remain part of the member training file.

(18) Members shall be allowed to use only the make, model, and size respirator for which they have passed a fit test within the last twelve months.

(19) In cases where there is a reported failure of an SCBA the unit shall be removed from service, tagged and recorded as such, and tested before being returned to service.

(20) Fire fighters shall be thoroughly trained in accordance with the manufacturer's instructions on emergency procedures such as use of regulator bypass valve, corrective action for facepiece and breathing tube damage, and breathing directly from the regulator (where applicable).

(21) Compressed gaseous breathing air in the SCBA cylinder shall meet the requirements of ANSI/CGA G7.1 - Commodity Specification for Air, with a minimum air qual-

ity of grade D, as well as meeting a water vapor level of 24 ppm or less.

(22) SCBA cylinders shall be hydrostatically tested within the periods specified by the manufacturer and the applicable governmental agencies.

Additional reference: Chapter 296-62 WAC, Part E.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-04001, filed 5/10/96, effective 1/1/97.]

WAC 296-305-04501 Automotive fire apparatus design and construction. (1) All new fire apparatus with the exception of specialized equipment, shall conform to the following minimum safety standards contained in NFPA Booklets No. 1901, 1902, 1903, 1904, and other 1900's.

(2) Fire apparatus, purchased after December 17, 1977, weighing 10,000 pounds or more shall conform with the following U.S. Department of Transportation standards, when applicable:

- (a) 571-121 Standard 121, Air brake systems;
- (b) 571-106 Standard 106, Hydraulic brake hoses;
- (c) 571-211 Standard 211, Wheel nuts, wheel discs, hub caps.

(3) Employers acquiring used apparatus or used equipment shall not be required to bring it under a more stringent code than the one in force at the time the apparatus was manufactured. However, such vehicle must meet applicable U.S. Department of Transportation standards and WAC 296-24-233.

(4) Fire apparatus tailboards and steps shall have a non-skid rough surface.

(5) Exhaust systems shall be installed and maintained in proper condition, and shall be so designed as to minimize the exposure of the fire fighter to the exhaust gases and fumes.

(6) Spinner knobs shall not be attached to the steering handwheel of fire apparatus.

(7) The transmission shifting pattern of the apparatus shall be clearly stenciled or labeled and posted so it can be clearly read by the driver while operating the apparatus.

(8) The height of any apparatus, over seven feet in height from the ground to the top of the beacon or highest point of the apparatus, shall be clearly labeled in a place where it can be easily and clearly read by the driver while operating the apparatus.

(9) All apparatus in excess of 10,000 pounds loaded weight, shall have the weight of the vehicle in pounds and tons clearly labeled in a place where it can be easily and clearly read by the driver while operating the apparatus.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-04501, filed 5/10/96, effective 1/1/97.]

WAC 296-305-04503 Automotive fire apparatus equipment. (1) Vehicles used to transport fire fighters and employer representatives shall have compartments for carrying sharp tools, saws, chisels, axes, etc., or if carried on the outside of the apparatus, equipment with sharp points and edges shall be covered to prevent injury to fire fighters and employer representatives.

(2) Personnel restraints for traveling.

(a) All persons riding on fire apparatus shall be seated and secured to the vehicle by seatbelts or safety harnesses at any time the vehicle is in motion.

(b) Seatbelts shall comply with U.S. Department of Transportation Part 49 CFR Section 571, Standards 209 and 210.

(c) Riding on tailsteps or in any other exposed position such as sidesteps or running boards shall be specifically prohibited.

(d) Standing while riding shall be specifically prohibited.

Note: See WAC 296-305-07011(3) for exceptions for wildland vehicles.

(3) Each fire apparatus shall carry a current U.S. Department of Transportation chemical identification book or the equivalent.

(4) Ladders stowed on the sides of apparatus, which protrude past the tailboard, shall have guards over the protruding ends.

(5) No employer shall permit automotive fire apparatus equipment which has an obstructed view to the rear, to be used in reverse gear unless the equipment has in operation a reverse signal alarm distinguishable from the surrounding noise level.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-04503, filed 5/10/96, effective 1/1/97.]

WAC 296-305-04505 Automotive apparatus operational rules. (1) Each employer of staffed fire apparatus shall establish a written policy and procedure whereby the apparatus has a scheduled daily operational check. Each employer of unstaffed fire apparatus shall establish a schedule appropriate to that department's activities.

(2) Any item found to be in need of repair shall be reported immediately to the officer in charge or other appropriate person.

(3) Fire fighting apparatus shall be brought to a full stop before employees are allowed to step from the apparatus.

(4) Fire fighters shall not be in the apparatus hose bed while hose is being run out from the bed.

(5) Headlights shall be on at all times when any fire or emergency vehicle is responding to a call.

(6) All apparatus over 20,000 pounds (gross vehicle weight) shall utilize wheel blocks when parked at an emergency scene.

(7) Apparatus responding to alarms shall meet specifications in RCW 46.61.035, relating to operations of authorized emergency vehicles.

(8) All operators of emergency vehicles shall be trained in the operations of apparatus before they are designated as drivers of such apparatus. The training program shall be established by each fire department. Once trained, all operators shall familiarize themselves with any apparatus prior to operating such apparatus even for brief periods of time.

Additional Reference: Washington State Fire Protection Bureau - Emergency Vehicle Accident Prevention (EVAP) program.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-04505, filed 5/10/96, effective 1/1/97.]

WAC 296-305-04507 Fire apparatus maintenance and repair. (1) If at any time a fire apparatus is found to be in an unsafe condition, it shall be reported immediately to the officer on duty.

(2) If in the officer's determination, the apparatus cannot be used in a safe manner, it shall be taken out of service until it has been restored to a safe operating condition.

(3) All repairs and preventive maintenance to fire apparatus shall only be made by personnel deemed qualified by the registered owners of the fire apparatus.

(a) A preventive maintenance program shall be instituted and records maintained for each individual apparatus in order to record and track potential or on-going problems.

(b) A minimum annual service test of apparatus shall be made according to NFPA guidelines relating to pumper apparatus.

(c) Failure of any portion of the annual service test shall constitute the apparatus to be placed out of service as a pumper until adequate repairs are made and the apparatus successfully completes said tests.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-04507, filed 5/10/96, effective 1/1/97.]

WAC 296-305-04509 Aerial ladders. (1) When operating aerial ladders, the manufacturer's suggested procedures shall be followed.

(2) Aerial ladders shall be used according to the following requirements:

(a) The number of fire fighters permitted on aerial ladders shall be in accordance with the manufacturer's instructions.

(b) Aerial ladders shall not knowingly be positioned under dangerous cornices or other loose overhanging objects that may endanger fire fighters and fire fighters working on, or climbing the ladders, except where rescue operations are essential.

(c) When working on, or near energized electrical lines, the following minimum working clearances shall be observed:

(i) For lines rated 50 kv or below, the minimum clearance between the lines and any part of the equipment shall be ten feet.

(ii) For lines rated over 50 kv, the minimum clearance shall be ten feet plus 0.4 inch for each 1 kv.

(iii) For low voltage lines (operating at 750 volts or less), the work shall be performed in a manner to prevent the fire fighters contacting the energized conductor.

(d) Fire apparatus aerial ladders shall be positioned for the greatest stability feasible at the fire scene.

(e) The tip of the aerial ladder shall not be forcefully extended against a solid structure.

(f) Aerial ladders shall not be extended or retracted while fire fighters are climbing the ladder.

(g) Locking in shall not be permitted. If it is necessary for fire fighters to be positioned on the aerial, they shall be secured by a life belt.

(h) Ladder pipes, when in use, shall be secured to the aerial in such a manner so that the ladder pipe cannot accidentally be dislodged while in operation.

(i) The operator of an aerial ladder shall remain on the turntable whenever fire fighters are working on the aerial. If the ladder is used only as a ground ladder, no operator is needed on the turntable.

(3) The following shall regulate the design and use of the operating turntable and ladder:

(a) Ladders shall be designed to have nonskid protection on the rungs.

(b) Turntable controls and valves for rotating, extending, or elevating the aerial ladder shall be clearly and distinctly marked as to function.

(c) Aerial controls shall be spring loaded and have a safety catch so that the controls shall return to the neutral position if the operator is incapacitated.

(d) The operator of the aerial shall be provided with a nonskid surface on the turntable surface.

(e) A railing of approximately 44 inches in height, and if possible, not less than 36 inches in length, shall be installed on the turntable in back of the operators position.

(f) A light of not less than 10,000 candlepower shall be provided at the base to illuminate the ladder at night in any position of operation.

(4) The following shall regulate the communication systems on the aerial ladder and on the automotive fire apparatus.

(a) A two-way voice communication system shall be installed between the top fly of the ladder and the lower control station.

(b) There shall be some type of electrical signal or voice communication located in the tractor of tillered aerial for communication signals between the tillerman and driver. The apparatus shall not be moved unless the proper signal, as shown in Appendix E, is received from the tillerman.

(5) When maintaining the aerial ladder, the manufacturer's instructions shall be followed.

(a) Cables, pulleys, rails and rungs of aerial ladders shall be inspected for wear and tightness on a monthly basis or every ten hours of operating time, whichever comes first.

(b) Pulleys on the aerial with cracks or pieces broken out of rims shall be replaced.

(c) Cables showing evidence of damage or wear shall be replaced.

(d) Rungs or rails that have been subjected to unusual impact shall be tested before usage.

(6) The automotive fire apparatus used in conjunction with aerial ladders shall be designed and used according to the following:

(a) Ground jacks or outriggers shall be deployed before an aerial ladder is put into operation.

(b) Ground plates shall be deployed under the outriggers or jacks at all times.

(c) Hand, airbrakes, and spring brakes for fifth wheel shall be set whenever an aerial ladder is in operation.

(d) In addition to ground jack supports and outriggers, wheel blocks shall be used whenever the aerial is in operation.

(e) Wheel chocks shall be rated by the manufacturer of the chock for the apparatus it is to be used on.

(f) Sand shall be put under jacks and outriggers when operating on ice or snow.

(7) Annual testing of metal aerial ladders shall follow the recommendations of the current National Fire Protection Association Standard.

(a) The aerial ladder, as well as the support section of the apparatus which supports the turntable, shall be nondestructively tested by a certified testing agency every five years.

(b) After any accident that causes structural damage, the test in (a) shall be performed and all defects detected shall be corrected before the apparatus is returned to service.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-04509, filed 5/10/96, effective 1/1/97.]

WAC 296-305-04511 Elevated platforms. (1) Elevated platform system design requirements:

(a) The platform shall have a minimum floor area of fourteen square feet.

(b) The platform shall be provided with a guard railing. The guard railing shall be 42 to 45 inches high on all sides.

(c) The railing shall be constructed so that there is no opening below it greater than 19 inches.

(d) There shall be two gates below the top railing, each of which shall be provided with suitable safety latches.

(e) A kick plate not less than four inches high shall be provided around the floor of the platform.

(f) Drain openings shall be provided to prevent water accumulation on the platform.

(g) A heat-protective shield shall be provided on the platform for the protection of the operator.

(h) Hydraulic or pneumatic systems shall have a minimum bursting strength of at least four times the operating pressure for which the system is designed.

(i) The basic structural elements of the hydraulic or articulating boom shall have a safety factor of three.

(j) Each hydraulic or pneumatic system for the boom shall be equipped with a pilot operated check valve or other appropriate device to prevent free fall in the event of hydraulic failure.

(2) Requirements related to the controlling of elevated platforms:

(a) A control or device shall be provided at both the lower control station and the platform control station to allow either operator to completely deactivate the platform controls.

(b) During the deactivation of the platform controls, the lower controls shall remain operable.

(c) A plate shall be located at the platform control unit or units listing the following information:

(i) Model and serial number of the manufacturer;

(ii) Rated capacity of the platform;

(iii) Operating pressure of the hydraulic or pneumatic systems or both;

(iv) Caution or restriction of operation or both; and

(v) Control instructions.

(vi) This plate shall be clearly visible to the operator at the lower control position.

(d) There shall be an operator at the lower controls at all times while the fire fighter is in the bucket.

(e) The operator at the lower controls shall make certain the fire fighter on the platform is secured by his life belt, or equivalent, before raising the platform.

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(3) Testing of elevated platforms and related apparatus shall be conducted annually.

(a) Testing of elevated platforms and related apparatus shall be in accordance with NFPA, Standard for Testing Fire Department Aerial Ladders 1914, 1991 edition.

(b) It is recommended that the boom section as well as the support section of the apparatus which supports the turntable should be nondestructively tested by a certified testing agency every five years.

(c) After any accident that causes structural damage, testing shall be performed and all defects detected shall be corrected before the apparatus is returned to service.

(d) Elevated platform testing shall follow recommendations of the current National Fire Code.

(e) Fire apparatus elevated platforms shall be positioned for the greatest stability feasible at the fire scene.

(4) A two-way voice communication system shall be installed between the platform and the lower control station.

(5) Automotive apparatus used in conjunction with elevated platforms shall be used in accordance with the following:

(a) Hand or air brakes shall be set before the platform is operated.

(b) Jacks or outriggers shall be used if the platform is to be elevated.

(c) Wheel blocks shall also be used when the platform is in operation unless the type of apparatus is one that has wheels that lift off the ground when the jacks or outriggers are engaged.

(d) Ground plates shall be used under the outriggers or jacks.

(e) Sand shall be put under jacks and outriggers when operating on ice or snow.

(f) When working on or near energized electrical lines, the fire department shall develop operational procedures for observing the following minimum working clearances:

(i) For lines rated 50 kv or below, the minimum clearance shall be ten feet.

(ii) For lines rated over 50 kv, the minimum clearance shall be ten feet plus 0.4 inch for each 1 kv.

(iii) For low voltage lines (operating at 750 volts or less), the work shall be performed in a manner to prevent the fire fighters contacting the energized conductor.

(6) Appliances mounted on elevated platforms. Platform mounted monitors shall be operated in accordance with the manufacturer's instructions.

Additional References: WAC 296-24-885.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-04511, filed 5/10/96, effective 1/1/97.]

WAC 296-305-05001 Emergency fireground operations—Structural. (1) The fire department shall establish an incident command system (ICS) with written guidelines applying to all members involved in emergency operations. All members involved in emergency operations shall be familiar with the ICS system. Personnel shall be trained and qualified by their department in the incident command system prior to taking a supervisory role at an emergency scene.

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(2) At an emergency incident, the incident commander shall be responsible for the overall safety of all members and all activities occurring at the scene.

(3) All emergency incidents shall be managed by an ICS, the incident commander shall establish an organization with sufficient supervisory personnel to control the position and function of all members operating at the scene and to ensure that safety requirements are satisfied.

(4) At an emergency incident, the incident commander shall have the responsibility to:

(a) Assume and confirm command and take an effective command position.

(b) Perform situation evaluation that includes risk assessment.

(c) Initiate, maintain, and control incident communication.

(d) Develop an overall strategy and attack plan and assign units to operations.

(e) Develop an effective incident organization by managing resources, maintaining an effective span of control, and maintaining direct supervision over the entire incident by creating geographical and/or functional areas as appropriate for the scope and size of the incident.

(f) Review, evaluate, and revise the operational plan as required.

(g) Continue, transfer, and terminate command.

(5) The fire department shall develop a risk management policy that can be implemented into the function of incident command and the development of incident strategies.

The risk management policy should include direction and guidance to the incident commander in formulating incident planning relating to the level of risk that may be undertaken in any given incident to save lives and to save property in as safe a manner as dictated by the situation.

(6) The fire department shall establish written procedures and guidelines for tracking all members operating at an emergency incident.

(7) The incident command system shall provide for control of access to hazardous areas of the incident scene by department members.

(8) Fire fighters operating in hazardous areas at emergency structural fire incidents shall operate in teams of two or more.

Team members operating in hazardous areas shall be in communication with each other through visual, audible, physical, safety guide rope, or electronic means, or by other means in order to coordinate their activities. Team members shall be in close proximity to each other to provide assistance in case of emergency.

(9) The fire department shall provide personnel for the rescue of members operating at emergency incidents as the need arises.

(10) In the "initial stage" of a structure fire-incident where only one team is operating in the hazardous area, at least one additional fire fighter shall be assigned to stand by outside of the hazardous area where the team is operating.

(a) The responsibility of the standby fire fighter shall be the maintaining awareness of the status of fire fighters in the hazardous area.

(b) The standby fire fighter shall remain in positive communication with the entry team, in full protective clothing with SCBA donned, in the standby mode.

(c) The standby fire fighter shall be permitted to perform other duties outside the hazardous area, provided constant communications is maintained with the team in the hazardous area.

(11) Once additional crews are on the scene and assigned, the incident shall no longer be considered in the initial stage. At this point, the incident commander shall evaluate the situation and risks to operating crews. First and primary consideration shall be given to providing a rapid intervention team(s) commensurately with the needs of the situation.

(a) A rapid intervention team shall consist of at least two members and shall be available for the rescue of a member or a crew if the need arises.

(b) A rapid intervention team(s) shall be fully equipped with the appropriate protective clothing, protective equipment, SCBA, and specialized rescue equipment needed, based on the specifics of the operation underway.

(c) The composition and structure of rapid intervention teams shall be flexible based on the type of incident, the size and complexity of the operation.

(12) The fire department shall develop and maintain written guidelines for the safety of members at incidents that involve violence, unrest, or civil disturbance. Such situations may include but not be limited to riots, fights, violent crimes, drug related situations, family disturbances, deranged individuals, and people interfering with fire department operations.

(13) Officers at emergency scenes shall maintain an awareness of the physical condition of members operating within their span of control and ensure that adequate steps are taken to provide for their safety and health. The command structure shall be utilized to request relief and reassignment of fatigued crews.

(14) Wildfire suppression personal protective clothing/equipment shall not be utilized for interior attacks on structures.

(15) Teams in the hazardous area shall have positive communication capabilities with the incident command structure. Incident radio communication capabilities within the incident command structure shall include monitoring of incident-assigned frequencies (including mutual aid radio frequencies).

(16) Prior to overhaul, buildings shall be surveyed for possible safety and health hazards. Fire fighters shall be informed of hazards observed during the survey.

(17) During the overhaul phase officers shall identify materials likely to contain asbestos, limiting the breaching of structural materials to that which is necessary to prevent rekindle.

(18) Floation devices shall be made available to fire fighters at incidents where drowning is a possibility. This is not intended to include pools and hot tubs.

(19) Fire fighters shall not cut the electrical drip loop providing power to the structure nor pull the electrical meter.

(20) Traffic cones or other traffic control devices shall be utilized when vehicular traffic hazards exist at an emergency operation.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-05001, filed 5/10/96, effective 1/1/97.]

WAC 296-305-05003 Confined space rescue operations. (1) Fire departments shall comply with chapter 296-62 WAC, Part M for their own confined spaces.

(2) Fire departments which have been contracted as an outside rescue service provider shall also comply with Part M and in particular the specific provisions of WAC 296-62-14519(1) which requires authorized entrant training and rescue practices from the host's actual permit spaces or representative permit spaces.

(3) Fire departments which have responded or will respond to calls to perform rescue from a noncontracted permit-required confined space are required to have each member of a rescue team practice making permit space rescues at least every 12 months by means of simulated rescue operations in which they remove dummies, mannequins or actual persons from permit space. A permit is required for the practice permit space entry.

(4) During an actual rescue response, written and/or verbally recorded hazard sizeup will be allowed in lieu of the written permit requirements in WAC 296-62-14507 and 296-62-14509 and shall be completed prior to any entry. This sizeup shall include at a minimum:

(a) Recognition and declaration of the situation as a confined space incident.

(b) Denial of entry to unprotected persons.

(c) Assessment of all readily available confined space documentation, e.g., MSDSs, any existing permit, plans or blueprints of the space.

(d) Assessment of number of victim(s), locations and injury conditions.

(e) Discussion with witnesses, supervisor, etc.

(f) Assessment of any current or potential space hazards, in particular, any hazard(s) which lead to the necessary rescue.

(g) Determination and declaration if body recovery or victim rescue.

(5) At confined space incidents, at least two people outside shall be equipped with appropriate breathing apparatus to act as the back-up team, which shall remain free of the contaminated area in order to rescue disabled fire fighters.

(6) Written documentation of the rescue team's training on the fire department's confined space operating procedures, authorized entrant training, if applicable, the contracted host's confined space program. A record of each of the hazard sizeups shall be maintained for at least one year.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-05003, filed 5/10/96, effective 1/1/97.]

WAC 296-305-05005 Rope rescue operations. (1) Fire departments engaged in rope rescue operations shall comply with the requirements of this section and WAC 296-305-02019.

(1999 Ed.)

(2) Employees engaged in rope rescue operations shall be properly trained and qualified by the employer to perform such activities.

(3) Employers shall establish standard operational procedures for rope rescue activities and training.

(4) When engaged in rope activities, employees shall be provided and wear either structural fire fighting helmets and gloves, or helmets that meet ANSI Standard Z89.1, 1986 edition, Class A and B; gloves.

(5) Records shall be maintained of inspections and repairs made to rope rescue equipment.

(a) Equipment shall be inspected after purchase and prior to placing in service, after each use, and at least semi-annually.

(b) Harnesses shall be inspected for worn or broken stitching, rivets worn out of holes, and damage from abrasion, cuts, or chemicals.

(c) Descending/ascending hardware shall be inspected for wear, cracks, distortion, sharp edges, and ease of operation.

(d) Equipment showing damage or wear that can affect employee safety, shall be either repaired prior to further use or retired.

(6) The manufacturer's recommended shelf life of rescue ropes shall be followed. If no shelf life is specified, ropes greater than six years old, whether used or not, shall be taken out of service or destroyed.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-05005, filed 5/10/96, effective 1/1/97.]

WAC 296-305-05007 Trench rescue operations. (1) Fire departments that engage in trench rescue operations shall adopt and maintain a written response program that addresses training and procedures to follow in emergency life threatening situations.

(2) Employees that directly engage in trench rescue operations shall be properly trained or shall be under the direct supervision of person(s) properly trained in operational procedures according to a Washington state accredited sixteen-hour emergency course or its equivalent.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-05007, filed 5/10/96, effective 1/1/97.]

WAC 296-305-05009 Watercraft rescue operations. (1) If a manufacturer's specifications are such that an engineer is required for the operation of a vessel, then one shall be provided.

(2) When fire boats perform rescue activities they shall have two dedicated personnel. Any member not specifically required to operate the vessel, e.g., an operator (pilot) or engineer (if required by the manufacturer's specification) may be used as a deck hand. This may include the boat officer if his/her duties do not include operating the fire boat.

(3) Watercraft load capabilities shall not exceed the manufacturer's specifications.

(4) Each fire department shall determine the function of their watercraft; as fire fighting, rescue, or both.

(5) Watercraft operating within navigable waters of the state of Washington (as defined by the United States Coast

Guard) shall comply with all of the rules of the United States Coast Guard.

(6) Fire boats operating within navigable waters of the state of Washington (as defined by the United States Coast Guard) shall have a fully dedicated pilot.

(7) The operator (pilot) of the watercraft is responsible for its safe operation.

(8) Training for all personnel shall represent the intent of the employer and physical characteristics of the vessel involved and shall be included in the employer's accident prevention program.

(a) All assigned personnel shall be trained in safe operation of watercraft and the operations the craft is intended to perform.

(b) All employees involved in water rescue shall be trained in water rescue techniques and wear Coast Guard approved personal flotation devices, Type 2, minimum.

Exception: Employees working below deck or in enclosed cabins.

(9) All employers operating watercraft in nonnavigable waters shall be responsible for training all employees to local hazards.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-05009, filed 5/10/96, effective 1/1/97.]

WAC 296-305-05011 Hazardous materials operations. Fire departments engaged in emergency response to releases of hazardous substances shall comply with chapter 296-62 WAC, Part P, Hazardous Waste Operations and Emergency Response.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-05011, filed 5/10/96, effective 1/1/97.]

WAC 296-305-05013 Aircraft rescue and fire fighting. Fire departments that engage in aircraft rescue and fire fighting operations shall review NFPA, Manual for Aircraft Rescue and Fire Fighting Operations 402M, 1991 edition.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-05013, filed 5/10/96, effective 1/1/97.]

WAC 296-305-05501 Fire training. (1) All members who engage in emergency operations shall be trained commensurate with their duties and responsibilities. Training shall be as frequent as necessary to ensure that members can perform their assigned duties in a safe and competent manner but shall not be less than the frequencies specified in this standard. Minimum training shall be as specified in this part.

(2) Live structural-fire training: Prior to being permitted to participate in live structure-fire training evolutions, the student shall have received adequate training in safety, protective breathing apparatus, fire hose, nozzles and fire streams, ladders, and rescue as defined by the employer.

(a) Strict safety practices shall be applied to all structures selected for live fire training evolutions.

(b) In preparation for live training, an inspection of acquired buildings shall be made to determine that the floors, walls, stairs and other structure components are capable of withstanding the weight of contents, participants and accumulated water.

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(c) Removal or neutralization of materials of all hazardous storage and conditions within the structure shall be accomplished.

(i) Closed containers and highly combustible materials shall be removed.

(ii) Oil tanks and similar closed vessels that cannot easily be removed shall be vented sufficiently to eliminate an explosion or overpressure rupture.

(iii) Any hazardous or combustible atmosphere within the tank or other vessel shall be rendered inert.

(iv) Hazards potentially dangerous to participants such as floor openings, missing stair tread and rails, and other such hazards shall be repaired or made inaccessible.

(d) If applicable, floors, railings and stairs shall be made safe. Special attention shall be given to potential chimney hazards.

(e) Debris hindering the access or egress of fire fighters shall be removed before continuing further operations.

(f) Buildings that cannot be made safe as required by this section shall not be utilized for interior live fire training.

Note: The water supply for any individual live fire training evolution should be assessed based on the extent of the evolution, size and structure of the building and contents to be involved, method of attack to be employed, protection of exposures and reserves for potential contingencies. Separate sources should be used for supply to attack and backup lines.

(g) Prior to conducting actual live fire training evolutions, a preburn briefing shall be conducted for all participants.

(i) All evolutions shall be discussed and assignments shall be made for all crews participating in the training sessions.

(ii) All participants shall have a knowledge and familiarity with the layout of the building.

(h) A safety officer shall be appointed for all live fire training evolutions.

(i) One person shall be designated to control the materials being burned and to ignite the training fire in the presence and under the direction of the safety officer. This person shall not be a student and shall wear full protective clothing, including SCBA.

(j) Unidentified materials such as debris which may burn in unanticipated ways, react violently, or create environmental hazards, shall not be used in live fire training evolutions.

(k) Each participant in a coordinated interior live fire training evolution shall be equipped with full protective clothing and SCBA. All participants shall be inspected by the safety officer to insure all protective clothing and SCBA are being properly worn prior to entry into a live fire training evolution.

(l) All instructors shall be deemed qualified to deliver structural fire fighting training by the employer. The instructor-student ratio shall not be greater than one to five.

(m) Officers shall make a head count both when entering and exiting a building during an actual attack.

(n) Supervisors at the training evolution shall maintain an awareness of the condition of members operating within the span of their control. They shall ensure adequate steps are taken to provide for the safety and health of the participants and relief or reassignment of fatigued persons.

(3) Fire fighters shall be trained in the function, donning and doffing, care, use, inspection, maintenance and limitations of the equipment assigned to them or available for their use.

(4) When fire fighters are engaged in training above the ten-foot level where use of life lines or similar activities are to be undertaken, a safety net shall be erected or other approved secondary means of fall protection such as recommended in chapter 296-155 WAC, Part C-1, Fall restraint and fall arrest, shall be used in lieu of nets.

(5) During wet training exercises, hose meeting the 250 pound annual hose test shall be used.

(6) Training shall be provided to fire fighters and officers in order that they will be knowledgeable in the identification and handling of asbestos containing materials likely to be encountered during a fire response.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-05501, filed 5/10/96, effective 1/1/97.]

WAC 296-305-05503 Summary of training requirements. (1) Training on hearing conservation shall conform to chapter 296-62 WAC, Part K, and WAC 296-305-02005.

(2) Training on medical procedures shall conform to WAC 296-305-02501.

(3) Training on respiratory equipment shall conform to chapter 296-62 WAC, Part E, Respiratory protection, and WAC 296-305-04001.

(4) Training on employee right-to-know procedures shall conform to chapter 296-62 WAC, Part C, Hazard communication.

(5) Training on overhaul procedures and operations shall conform to WAC 296-305-05001.

(6) Training on wildland fires shall conform to WAC 296-305-07001 through 296-305-07019.

(7) Training on confined space entry and/or rescue shall conform to chapter 296-62 WAC, Part M, Permit-required confined spaces and WAC 296-305-05003.

(8) Live fire training in structures shall conform to NFPA 1403 and this section.

(9) The employer shall provide training and education for all members commensurate with those duties and functions that members are expected to perform. Such training and education shall be provided to members before they perform emergency activities. Fire service leaders and training instructors shall be provided with training and education which is more comprehensive than that provided to the general membership of the fire department.

(10) The employer shall assure that training and education is conducted frequently enough to assure that each member is able to perform the member's assigned duties and functions satisfactorily and in a safe manner so as not to endanger members or other employees. All members shall be provided with training at least annually. In addition, members who are expected to perform interior structural fire fighting shall be provided with an education session or training at least quarterly.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-05503, filed 5/10/96, effective 1/1/97.]

(1999 Ed.)

WAC 296-305-06001 Fire service equipment. (1) All portable equipment shall be inspected routinely to ensure that it is ready for use.

(2) Any defective equipment shall be removed from service.

(3) Nylon utility straps or straps of equivalent strength should be used instead of hose belts. The utility strap shall be of one-inch nylon, or equivalent belting, with a four-inch overlap and sewn with polyester thread and shall measure at least 102 inches on the outside circumference.

(4) The load capacity shall be stenciled on each portable jack and the load capacity shall not be exceeded.

(5) The instruction plate on portable jacks shall be maintained in a legible condition.

(6) Portable powered cut-off saws (rescue saws) shall be used in accordance with the manufacturer's recommendations.

Exception:

The lower blade guard described in WAC 296-24-65501 (1)(a) is not required on hand-held portable powered cut-off saws used by fire/rescue personnel for rescue procedures and/or roof ventilation for smoke removal, provided the operator is wearing appropriate eye, face, head, and body protection as specified in WAC 296-305-02001 through 296-305-02013. This exception also applies to qualified persons (e.g., instructors) wearing personal protective equipment as described herein to instruct personnel in safe roof ventilation/rescue techniques.

(7) When not in use, the cutting teeth on a chain saw shall be covered either by an old section of hose, a wooden scabbard, or an equivalent method.

(8) All axes worn by employees shall be provided with a scabbard to guard against injury from the blade and pick of the axe.

(9) The guards on smoke ejectors, as supplied by the manufacturer, shall not be removed and the operator of the ejector shall wear gloves.

(10) Acetylene cylinders. Handling, storage and utilization of acetylene in cylinders shall be in accordance with the Compressed Gas Association Pamphlet G-1 - 1966 edition.

(11) Powder activated life-line guns and accessories shall be stored in a box or container equipped with a lid or cover.

(a) The box shall be kept closed when not in use.

(b) A loaded life-line gun shall not be placed in the storage box.

(c) Instruction books, cleaning kits and hand tools needed for maintenance or breakdown purposes shall be kept in the life-line gun storage box.

(d) The words "powder activated tool" shall be conspicuously printed on the top of the storage box.

(12) Abrasive blades in storage shall be protected from contact with water, liquids, petroleum products and their fumes.

(13) Fiber rope that has been subjected to injurious chemicals or excessive heat shall not be used for load carrying purposes.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06001, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06001, filed 11/30/83; Order 77-20, § 296-305-06001, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

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WAC 296-305-06003 Testing fire service equipment.

(1) When testing fire hose, a restricted orifice disc having not more than a 25% opening, shall be installed on the pumper discharge port. Or in the alternative, the pumper discharge valve may be opened not more than 25% to insure a minimum volume of water in case of a bursting hose.

(2) Safety nets shall be tested annually by dropping a weight of not less than 400 pounds from the highest point to be used above the net. The test weight object may consist of two tightly tied rolls of two and one-half inch hose, each 100 feet long, or any other object having similar weight and dimension.

(a) The net suspension system shall be designed and constructed with a safety factor of four and as a minimum, shall withstand the test loading without permitting contact between the net and any surface or object below the net.

(b) Forged steel safety hooks or shackles shall be used to fasten the net to its supports.

(c) Training requiring safety net protection shall not be undertaken until the net is in place and has been tested by the weight of three fire fighters on the net.

(d) Safety nets shall extend eight feet beyond the edge of the work surface.

(e) The mesh size of nets shall not exceed six inches by six inches.

(f) All nets shall meet accepted performance standards of 17,500 foot pounds minimum impact resistance as determined and certified by the manufacturer, and shall bear a label of proof test.

(g) Edge ropes shall provide a minimum breaking strength of 5,000 pounds.

(3) Life belts shall meet or exceed the strength requirements of ANSI A10.14 - Requirements for Safety Belts, Harnesses, Lanyards, Lifelines and Drop Lines for Industrial Use. Life belts shall be inspected after each use and not less than semi-annually in accordance with manufacturer's instructions.

(4) Rescue ropes shall be used for rescue purposes only.

(5) Rescue ropes shall meet the following requirements:

(a) Rescue ropes shall be constructed of rot-proof fiber with a melting point of not less than 400 degrees F;

(b) They shall be of abrasion resistant construction;

(c) They shall have a minimum breaking strength of not less than 9,000 pounds.

(6) Rescue ropes shall be inspected after each use and not less than semi-annually in accordance with manufacturer's instructions.

(7) The method of testing a life line gun shall be in accordance with the manufacturer's recommended procedure.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06003, filed 5/10/96, effective 1/1/97. Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06003, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06003, filed 11/30/83; Order 77-20, § 296-305-06003, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06005 Ground ladders. This section establishes the minimum requirements for the construction, care and use of the common types of ladders used in fire combat.

(1) Ladder locks or pawls on extension ladders shall be so fastened or secured to the beams that vibration and use will not cause loosening of bolts and nuts.

(a) Pawls or ladder locks shall be so constructed that the hook portion of the pawl that engages the rung shall have sufficient bearing surface or area to prevent the hook from cutting into rungs when engaged.

(b) Such hooks shall be properly finished to eliminate sharp edges and points.

(2) Staypoles or tormenters shall be furnished on all extension ladders extending over forty feet. Staypole or tormenters spikes shall not project beyond the butt of the ladder when nested.

(3) All ladders shall be stored in a manner to provide ease of access for inspection, and to prevent danger of accident when withdrawing them for use.

(4) Fire fighters shall climb and descend ground ladders with the fly in, for safety purposes, when not in conflict with the manufacturer's recommendations. Even when ladders are routinely used in the fly out configuration, in adverse conditions fire fighters shall be permitted to climb and descend ground ladders with the fly in to assure secure footing.

(5) All ladders regardless of type shall be inspected thoroughly after each use. Records shall be kept of the inspections and repairs.

(6) The following metal ladder components shall be checked:

(a) Rungs for welds, damage or weakness caused by overloading or bumping against other objects, looseness and cracks, etc.

(b) Beams for welds, rivets and bolts, signs of strain or metal fatigue, and deformation from heat or overloading.

(c) Bolts and rivets for tightness.

(d) Butt spurs for excessive wear or other defects.

(e) Halyards for the same defects listed for wood ladder halyards and cable halyards, for fraying or breaking.

(f) Heat sensor label, when provided, for change indicating heat exposure.

(7) The following wood ladder components shall be checked:

(a) Bolts for snugness and tightness without crushing the wood.

(b) Beams for dark streaks; when a wood ground ladder develops dark streaks in the beams, the ladder shall be removed from service and service tested as specified in this chapter, prior to further use.

(c) Protective varnish finish for damage or wear, at least once a month and redone annually or at such frequency as specified by the manufacturer. If the protective finish becomes charred or blistered, the ladder shall be removed from service and service tested as specified in this chapter, prior to further use.

(8) Methods of fastening ladder halyards, either of wire or fibrous material, shall be in a manner that the connection is stronger than the halyard.

(9) Any defect noted in above visual inspection shall be corrected prior to testing.

(10) Every portable ladder shall be tested following the correction of defects disclosed by the visual inspections.

(11) New ground ladders purchased after the effective date of this chapter shall be constructed and certified in accordance with the requirements of NFPA Standard 1931, 1994 edition.

(12) All fireground ladders shall be inspected and maintained in accordance with the requirements of NFPA Standard 1932, 1994 edition. When metal ground ladders are tested, they shall be tested in accordance with the requirements of NFPA Standard 1932, 1984 edition.

(a) Extension ladders that were constructed prior to the adoption of the 1984 edition of NFPA 1931, may, when tested in accordance with this chapter, be tested with a minimum test load of 400 pounds and a preload of 300 pounds. Ladders tested under this exception shall be used with a maximum load limit of 500 pound distributed or 400 pound concentrated. Ladders shall be tested in the configuration they are used.

(b) Additional requirements for wooden ground ladders; whenever any wood ground ladder has been exposed or is suspected of having been exposed to direct flame contact the ladder shall be service tested as specified in section 5-2 of NFPA Standard 1932, 1984 edition.

Note 1: Hardness testing and eddy current NDE testing is not required in the fire department annual maintenance inspection unless the individual ladder has been subjected to a high heat exposure which could have annealed the metal and diminished the structural integrity. The ladder manufacturer's recommendations should be followed with respect to hardness and eddy current testing.

Note 2: Testing should follow the recommended procedures taught by Washington State Fire Protection Bureau.

Additional references: Chapter 296-24 WAC, Part J-1.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06005, filed 5/10/96, effective 1/1/97. Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06005, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06005, filed 11/30/83; Order 77-20, § 296-305-06005, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06007 Electrical. (1) Temporary lighting with the use of 110 - 120 VAC equipment.

(a) All lighting equipment shall be provided with heavy duty flexible cords with SO or SJ jackets or equivalent. All lighting equipment shall be used with heavy duty flexible extension cords with 12-3 conductors with SO or SJ jackets or equivalent.

(b) Electrical cords shall have weather tight bodies and caps, 20 amp rated at 120 VAC.

(c) Temporary lights that are used in moist, damp, and/or other hazardous locations shall be approved for the purpose.

(d) Temporary lights shall be constructed so that water cannot enter or accumulate in wireways, lampholders or other electrical parts.

(e) Temporary lights that are used in moist and/or other hazardous locations shall have 120 VAC single-phase 15 and/or 20 amp in-line resettable ground fault circuit interrupters.

(f) Temporary lights shall be equipped with a handle and be insulated from heat and possible electrical shock.

(g) Temporary lights shall not be suspended by their electrical cords unless cords and lights are designed and labeled for this means of suspension.

(1999 Ed.)

(h) Temporary lights shall be protected by guards of a nonconductive or insulated material to prevent accidental contact with the bulb.

(2) 120 VAC cord reels shall be approved for use in damp or hazardous locations.

(a) Bodies and caps shall be weather tight, 20 amp rated at 120 VAC.

(b) Cords on cord reels that do not exceed 150 feet in length shall be SO or SJ type jackets or equivalent.

(c) Cords that exceed 150 feet in length on reels, shall have 10-3 conductors.

(d) Cord reels that are not permanently mounted on a vehicle shall be insulated from the ground when in use.

(3) Twelve volt portable type hand lanterns shall be constructed of molded composition or other type approved for the purpose.

(a) Portable hand lanterns used in moist and/or other hazardous locations shall be operated at a maximum of 12 volts.

(b) Hand lamps shall be equipped with a handle and a substantial guard over the bulb and attached to the lampholder.

(4) Portable and vehicle-mounted generators.

(a) Portable generators. Under the following conditions, the frame of a portable generator shall not be required to be grounded and shall be permitted to serve as the grounding electrode for a system supplied by the generator:

(i) The generator supplies only equipment mounted on the generator or cord-connected and plug-connected equipment through receptacles mounted on the generator, or both, and

(ii) The noncurrent-carrying metal part of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame.

(b) Vehicle-mounted generators. Under the following conditions, the frame of a vehicle may serve as the grounding electrode for a system supplied by a generator located on the vehicle:

(i) The frame of the generator is bonded to the vehicle frame; and

(ii) The generator supplies only equipment located on the vehicle and/or cord-connected and plug-connected equipment through receptacles mounted on the vehicle or on the generator; and

(iii) The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame.

Additional references: Article 250 National Electrical Code. Chapter 296-24 WAC, Part L.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06007, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06007, filed 11/30/83; Order 77-20, § 296-305-06007, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06501 Requirements for fire station facilities. WAC 296-305-06501 through 296-305-06519 pertain to all fire department facilities as defined in WAC 296-305-01005.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06501, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06501,

filed 11/30/83; Order 77-20, § 296-305-06501, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06503 General requirements. (1) Stations and administrative offices shall comply with the requirements of the general occupational health standards, WAC 296-62-09003, Lighting and illumination.

(2) Every new fire station built after the effective date of this chapter, whether manned or unmanned, shall be equipped with an approved emergency lighting system that will light dormitories, hallways, and apparatus bay areas in case of electrical power failure.

(3) No new fire station or new addition to an existing fire station, shall incorporate sliding poles or slides in their design or construction.

(4) The requirements of chapter 296-24 WAC, Part B-2, Window washing, shall be followed when employees are engaged in window washing operations.

(5) All new fire stations and other new fire department facilities which contain sleeping quarters shall be fully protected with automatic sprinkler systems.

(6) All existing fire stations and existing fire department facilities with sleeping quarters, that undergo a major renovation that consists of more than sixty percent of the assessed evaluation of the existing structure shall be fully protected with automatic sprinkler systems.

(7) Eye protection shall be worn when charging, changing or adding fluid to storage batteries. Personnel that will be charging storage batteries shall be qualified to perform this function by the employer. See WAC 296-24-23015.

(8) Stairway tread shall be of a nonskid design. Examples of nonskid: Grip strut grating, serrated edge grating, metal grating, aluminum safety tread, abrasive metal stair tread, or pressure sensitive nonskid type.

(9) In existing facilities where sliding poles or slides are used, the pole or slide hole shall be guarded in such a manner as to prevent anyone from walking directly into the pole or slide hole opening.

(10) To absorb the shock to sliding employees, the bottom of all slide poles or slides shall have a three-foot diameter cushioned rubber mat, or its equivalent.

(11) Nothing shall be stored or placed at the bottom of a pole or slide hole for a radius of three feet from the pole. Doors shall not protrude within three feet of the pole or slide.

(12) Stair and landing protection: Stairways, guardrails, landings, and handrails shall be constructed to the requirements of chapter 19.27 RCW the State Building Code Act, and chapter 296-24 WAC, Part J-1.

(13) A standard guard railing for a landing platform shall include a toeboard, which is a vertical barrier, at floor level erected along exposed edges of a floor opening, wall opening, platform, runway or ramp to prevent falls of material.

(14) Any new facility, or addition, alteration, or repair to an existing facility shall be in compliance with chapter 19.27 RCW, the State Building Code Act.

(15) New stations containing a kitchen, and station kitchens remodeled after the date of this chapter, shall have an alarm activated service disconnect of fixed cooking appliances.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06503, filed 5/10/96, effective 1/1/97. Statutory Authority:

[Title 296 WAC—p. 2478]

RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06503, filed 11/30/83; Order 77-20, § 296-305-06503, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06505 Sanitation, disinfection, cleaning, and storage areas. (1) Fire departments shall provide facilities for disinfecting, cleaning, and storage.

(2) A designated cleaning area shall be provided for under the fire department's exposure control plan for the cleaning and disinfecting of protective equipment, portable equipment, and other clothing.

(a) Fire departments that engage in emergency medical operations shall provide or have access to disinfecting facilities for the cleaning and disinfecting of emergency medical equipment.

(b) Disinfecting shall not be conducted in fire station kitchen, living, sleeping, or personal hygiene areas.

(c) Disinfecting facilities in fire stations shall be vented to the outside environment, and designed to prevent contamination of other fire station areas.

(d) The disinfecting facility shall contain a sink with hot and cold water faucets. All surfaces shall be nonporous surfaces.

(e) Handwashing facilities shall be readily accessible to members. Handwashing facility means a facility providing an adequate supply of running potable water, soap and single use towels or hot air drying machines. When provision of handwashing facilities is not feasible, the employer shall provide either an appropriate antiseptic hand cleaner in conjunction with clean cloth/paper towlettes or antiseptic towlettes.

(3) Protective clothing or equipment that needs to be decontaminated and/or disinfected shall not be allowed in any kitchen, living, sleeping, or personal hygiene area.

(4) The designated cleaning area shall be physically separate from areas used for food preparation, cleaning of food and cooking utensils, personal hygiene, sleeping, and living areas.

(5) Drying areas for protective clothing shall be well ventilated.

(6) Storage areas: Emergency medical supplies and equipment stored in fire stations, other than that stored on vehicles, shall be stored in a dedicated enclosure and maintained per manufacturer's instructions.

(7) Reusable emergency medical supplies and equipment, protective clothing, and protective equipment shall not be stored in kitchen, living, sleeping, or personal hygiene areas, nor shall it be stored in personal clothing lockers.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06505, filed 5/10/96, effective 1/1/97. Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06505, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06505, filed 11/30/83; Order 77-20, § 296-305-06505, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06507 Sleeping areas. (1) All sleeping areas in fire stations shall be separated from vehicle storage areas by at least one-hour fire resistive assemblies. Compliance with this section shall be required within three years of the effective date of this chapter.

(2) Sleeping areas shall be protected by smoke detectors.

(1999 Ed.)

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06507, filed 5/10/96, effective 1/1/97. Statutory Authority: Chapter 49.17 RCW, 88-14-108 (Order 88-11), § 296-305-06507, filed 7/6/88; Order 77-20, § 296-305-06507, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06509 Apparatus areas. (1) Three feet of clearance shall be maintained around apparatus parked within the station where the station's width permits.

(2) All fire stations built after December 17, 1977, shall have a minimum of three feet of clearance around the apparatus, which shall be maintained free of any storage or obstruction.

(3) The station's apparatus floors shall be kept free of grease, oil, water and tripping hazards.

(4) Floors shall have slip-resistant surfaces on areas where personnel would normally mount or dismount apparatus.

(5) No Class I or Class II flammable liquids shall be used for cleaning purposes to remove grease or dirt from apparatus.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06509, filed 5/10/96, effective 1/1/97. Statutory Authority: Chapter 49.17 RCW, 88-14-108 (Order 88-11), § 296-305-06509, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06509, filed 11/30/83; Order 77-20, § 296-305-06509, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06511 Indoor air quality. Air quality shall be consistent with WAC 296-62-075 through 296-62-07515, Air contaminants and WAC 296-62-12000 through 296-62-12009, Environmental tobacco smoke in office work environments.

Note: For extended work shifts all eight-hour PEL's shall be time-weighted to adjust for additional worker exposure during extended work shifts.

(1) If indoor air monitoring indicates over-exposure to contaminant PEL's, engineering controls shall be utilized to reduce fire fighter exposure to the lowest feasible level.

(2) All fixed internal combustion equipment such as, but not limited to emergency generators, shall be effectively exhausted to the exterior of the fire stations.

(3) All facilities dedicated to the maintenance and repair of internal combustion equipment shall have means for effective ventilation to the exterior of the building.

(4) All fire stations built after January 1, 1997, shall be designed and constructed to conform to ACGIH ventilation recommended criteria for exhaust of internal combustion engines.

Additional reference: Industrial Ventilation Manual of Recommended Practices ISBN No.: 0-936712-65-1.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06511, filed 5/10/96, effective 1/1/97; Order 77-20, § 296-305-06511, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06513 Refueling areas. (1) Refueling pumps, if installed, shall be in accordance with the provisions of the Uniform Fire Code and WAC 296-24-33015.

(2) Dispensing of Class 1 liquids shall be as required in the Uniform Fire Code.

(1999 Ed.)

(3) Spillage of oil or fuel shall be properly disposed of or completely evaporated and the fuel tank cap replaced before restarting engine.

(4) Fueling areas shall be posted - "NO SMOKING - STOP YOUR MOTOR."

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06513, filed 5/10/96, effective 1/1/97; Order 77-20, § 296-305-06513, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06515 Hose drying towers. (1) The floor openings on hose tower platforms shall be equipped with a forty-two inch guardrail with mid-rail and shall be capable of withstanding a force of 250 pounds applied in any direction at any point on the top rail. The work platform shall be equipped with toeboards.

(2) The requirements for offset ladder platforms and ladder cage guards, when ladders extend beyond twenty feet, shall apply to hose drying towers.

(3) Ropes and attachments used to hoist hose in the hose towers shall have a breaking strength of 1500 pounds for a safe load strength of 300 pounds (five-to-one safety factor).

(4) Approved head protection shall be worn by all persons in the hose tower whenever hose handling/hanging operations are taking place.

(5) Ropes utilizing a pulley block shall be appropriately sized for the sheave to prevent possible jamming or damage to the rope.

Additional reference: Chapter 296-24 WAC, Part J-1.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06515, filed 5/10/96, effective 1/1/97; Order 77-20, § 296-305-06515, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06517 Drill tower training facilities.

(1) Permanent fixed ladders on the outside of drill towers and drill buildings are exempt from the requirements of offset platform landings and ladder cage guards.

(2) Drill tower construction and operations shall comply with the following:

(a) Burn buildings used for live fire training shall be engineered for such use.

(b) Drill towers shall not be used for live fire training except when burn rooms are provided.

(c) Burn rooms, if included in the building, shall be engineered into drill towers.

(d) All walking surfaces in the drill tower shall be slip resistant.

(e) Railings shall be designed with a four-to-one safety ratio for 250 pound fire fighters who may be operating a charged hose line on the fire escape.

(f) Rappelling anchors shall be engineered to support 4500 pounds per person supported by the anchor.

(g) Rappelling anchors shall be readily identifiable.

(h) Rappelling anchors shall be certified by a structural engineer.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06517, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06517, filed 11/30/83; Order 77-20, § 296-305-06517, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06519 Fire station equipment and tools. (1) Equipment and tools in maintenance shops shall be guarded as required by the guarding provisions of chapter 296-24 WAC, Part C, Machine guarding, and Part H-1, Hand and portable powered tools.

(2) Exposure of fan blades. When the periphery of the blades of a fan is less than ten feet above the floor or working level, the blades shall be guarded. The guard shall have openings no larger than one-half inch. This provision shall not apply to residential ceiling fans.

(3) Abrasive wheels and grinders.

(a) All abrasive wheels and grinders, shall be guarded as required by chapter 296-24 WAC, Part C.

(b) Goggles or face shields shall be used when grinding.

(c) Abrasive and composite blades shall be stored and protected against exposure to fuel and oil.

(d) Work rests on bench mounted abrasive wheel grinders shall be used to support the work. These shall be of rigid construction and designed to be adjustable to compensate for wheel wear. Work rests shall be kept adjusted sufficiently close to the wheel with a maximum opening of one-eighth inch to prevent the work from being jammed between the wheel and the rest. Adjustment of the work rest shall not be made while the wheel is turning.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-06519, filed 5/10/96, effective 1/1/97.]

WAC 296-305-07001 Wildland fire operations. (1) This section shall apply to all personnel and agencies called on to provide services at any fire defined as a "wildland fire."

(2) This section shall not apply to suppression action taken on fires prior to the fire meeting the definition of a "wildland fire."

(3) Employers shall provide at no cost to the employee, the protective equipment and protective clothing required by this chapter. Personnel performing suppression actions on a wildland fire shall wear the provided protective clothing as directed by their fire department's procedures/guidelines.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07001, filed 5/10/96, effective 1/1/97. Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-07001, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-07001, filed 11/30/83; Order 77-20, § 296-305-07001, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-07003 Personal protective clothing and equipment for wildland fire fighting. (1) Protective apparel and equipment for wildland fire fighters shall be designed to provide thermal protection for the fire fighters against external heat sources with flame resistant clothing and equipment without creating high heat stress loads due to the prolonged work periods they experience. Members performing suppression on a wildland fire shall wear a provided protective clothing ensemble as directed by their employer. The combined protective clothing ensemble includes:

(a) Hardhat/helmet

(b) Upper and lower torso clothing

(c) Gloves

(d) Goggles

NFPA Standard Protective Clothing and Equipment for Wildland Fire fighting 1977, 1993 edition shall serve as a

[Title 296 WAC—p. 2480]

guideline for determining performance characteristics of this clothing.

(2) As a minimum, members shall wear provided leather lace-up boots of sturdy construction which shall extend upward a minimum of 8 inches above the top of the sole, which shall be slip resistant.

(3) Additional personal protective equipment to be provided and worn shall include a fire shelter as directed by the incident commander.

(4) Wildland protective clothing shall comply with this standard within two years of the effective date of this chapter.

(5) Personnel operating Type 1 or Type 2 engines assigned to structural protection will carry structural protective clothing on their assigned apparatus.

(6) Wildland personnel protective clothing shall not be used for interior structural fire fighting.

(7) Persons provided fire shelters shall be trained in their use and shall receive refresher training at least annually.

(8) Personnel wearing full structural fire fighting clothing while engaged in fighting wildland fires shall not expend more than one hour before rotating to rest and rehabilitation. Agencies may rotate crews to avoid the one-hour benchmark when containing and controlling wildland fires.

(9) Fire departments shall establish written procedures for the care, use, maintenance, and retirement criteria for protective equipment in conjunction with the manufacturers' recommendations.

(10) Fire departments shall establish written procedures for the use of protective clothing and protective equipment while performing fire fighting activities.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07003, filed 5/10/96, effective 1/1/97. Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-07003, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-07003, filed 11/30/83; Order 77-20, § 296-305-07003, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-07005 Respiratory protection for wildland fire fighters.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07005, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-07005, filed 11/30/83; Order 77-20, § 296-305-07005, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-07007 Wildland personnel accountability. (1) Wildland fire fighters shall not be required to wear personal alerting devices except when wearing self contained respiratory equipment.

(2) An officer shall maintain positive communication with any individual during those times that the member is assigned an ancillary fire fighting task (examples would include, but are not limited to, scout, safety officer, or watch person).

(3) Wildland fire fighters shall work in teams of two or more while working on or near the fire line of an active fire unless they are in visual or voice contact with an officer.

(4) On initial attack fires, the incident commander shall:

(a) Maintain the name and location of all personnel on the incident.

(b) On extended attack fires, ensure the maintenance of the name and location of all personnel within their unit, division, or branch.

(c) Transfer/confirm personnel and unit information to the appropriate incident command section (ICS) command staff as soon as possible.

(d) Ensure that personnel and unit information is recorded in the command post as soon as possible.

(5) When a fire "blows up" or makes a run that crosses planned control lines, officers shall conduct an accounting of all personnel assigned to fire suppression and report any missing personnel to the incident commander.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07007, filed 5/10/96, effective 1/1/97. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-07007, filed 11/30/83; Order 77-20, § 296-305-07007, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-07009 Apparatus standards for wildland fire fighting. This section applies to wildland fire apparatus meeting the NIIMS ICS typing of a Type 3 through Type 7 engine, and intended for use combating fires occurring in natural vegetation or occurring in natural vegetation and threatening improvements. See Appendix D for equipment types.

(1) In a wildland fire, an engine may provide the primary protection for a crew in the event of unexpected fire behavior or an action that places the engine crew in a position of being exposed to heat and smoke.

(2) Apparatus speed shall be determined to be safe if in the judgment of the officer in charge, the following are taken into consideration:

(a) The particular wildland fire attack methods being utilized including, but not limited to the nature of the fire, the type of terrain, weather conditions, equipment conditions, and whether personnel are positioned in wildland fire fighting enclosures;

(b) The forgoing provision shall not relieve a driver from the duty to drive with due regard for the safety of all persons in all conditions;

(c) Nor shall such provision protect the driver from the consequences of his/her reckless disregard for the safety of others.

(3) Because of the sheltering offered by an engine, the following minimum standards shall be complied with:

(a) The number of individuals working/assigned as an engine crew shall not exceed the manufacturer's cab capacity.

(b) Any time an engine is moved when not directly attacking a fire, personnel shall ride in the vehicle's enclosed cabin area, in a seat-belted location, or be off the vehicle.

(c) Any time engines are used in a mobile attack configuration, and personnel other than the driver are on the apparatus, personnel shall ride in the manufacturer's enclosed cabin, or use the personnel restraints and enclosures identified in WAC 296-305-07011.

(d) All personnel working on or around engines in a ground mobile attack mode or in riding positions shall have visual or voice contact with the driver.

(e) Vehicles operating in smoke or dust shall have their headlights, and if so equipped, a flashing or rotating roof light illuminated.

(1999 Ed.)

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07009, filed 5/10/96, effective 1/1/97; Order 77-20, § 296-305-07009, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-07011 Occupant restraints and enclosures for wildland fire fighting. (1) While in motion, the driver and passengers in the cab shall wear seatbelts.

(2) Seatbelts shall comply with U.S. Department of Transportation, Part 49 CFR, Section 571, Standards 209 and 210.

(3) Passengers on wildland vehicles shall use a safety belt or a short lanyard securely connected to the apparatus.

(a) Safety belts or lanyards shall be secured to an anchor-age or structural member capable of supporting a minimum dead weight of 1500 pounds per person or a 4:1 safety factor.

(b) Safety lanyard lengths shall not allow for the fire fighter to reach the ground.

(4) Safety belts shall be constructed and maintained in compliance with ANSI A10.14-1975.

(5) Lanyards shall be a minimum of one-half inch nylon or equivalent with a nominal breaking strength of 5400 pounds.

(6) The structural components for wildland vehicle enclosures shall be constructed of metal tubing not less than 1 inch in diameter, capable of supporting a minimum of 1500 pounds per person, a 4:1 safety ratio or the equivalent. This applies to vehicle enclosures manufactured after the effective date of this chapter.

(7) The enclosure shall be constructed to a minimum top-rail height of forty-two inches and shall include a mid-rail and either a toeboard at least four inches high or a bottom rail a maximum of six inches from the platform.

(8) Access door(s) and latching mechanisms to tail board enclosures shall be constructed and mounted to achieve structural integrity comparable to the remainder of the enclosure.

(9) A strap or butt-bar utilized for the fourth side of the enclosure shall be a minimum of a four-inch nylon strap capable of supporting 1500 pounds dead weight.

(10) Fire fighters while actively fighting a fire in the mobile attack mode shall remain in a three-sided enclosure and use a safety lanyard. When actively fighting a fire in the mobile attack mode, fire fighters shall remain in a four-sided enclosure but the use of a lanyard is optional and should follow the fire department's operating procedures.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07011, filed 5/10/96, effective 1/1/97.]

WAC 296-305-07013 Equipment for wildland fire fighting.

Note: Equipment is considered in this section as those items not configured as a part or portion of the vehicle body.

(1) All equipment on an apparatus shall be carried in an enclosed compartment or otherwise securely mounted on the apparatus and guarded, so that individuals can not accidentally come in contact with equipment that may injure them.

(2) All hand tools, when not in use, shall have appropriate covers and guards to prevent injury.

(3) Wildland fire fighters whose duties require them to operate a power chain saw shall wear flexible ballistic nylon pads, sewn or otherwise fastened into the trousers, or other

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equivalent protection that shall protect the vulnerable areas of the legs. Additional trouser, eye, hearing, face and head protection as required by this chapter shall be worn.

(4) Employees shall not use the chainsaw to cut directly overhead, or at a distance that would require the operator to relinquish a safe grip on the saw.

(5) Only personnel trained in firing equipment shall handle and use such equipment, and observe the manufacturers' recommendations.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07013, filed 5/10/96, effective 1/1/97.]

WAC 296-305-07015 Aircraft operations for fighting wildland fires. (1) Whenever fixed wing and rotary wing aircraft are being utilized on an incident, personnel trained in air operations management shall be assigned by the incident commander/operations section chief.

(2) Prior to the initiation of air operations, all personnel operating in close proximity to an air drop shall be notified of such activity.

(3) Personnel shall not intentionally operate in an area where it can reasonably be expected that they may be hit with retardants or suppressants from fixed wing or rotary aircraft.

(4) Radio communications shall be maintained between an aircraft/air attack officer and the appropriate ground officer.

(5) Personnel assigned to ride in rotary wing aircraft shall be briefed in the correct approach, riding and off-loading procedures for the particular type of aircraft.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07015, filed 5/10/96, effective 1/1/97.]

WAC 296-305-07017 First-aid for wildland fire fighters. (1) At all wildland fires, members shall be provided with a minimum of one quart per two-hour time period of electrolyte drinks or potable water.

(2) Officers at wildland fires shall be trained in the symptoms of heat-related disorders and shall observe their crews for such behavior. Appropriate action shall be taken in the event a crew member displays such symptoms.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07017, filed 5/10/96, effective 1/1/97.]

WAC 296-305-07019 Training for wildland fire fighting. (1) This section shall apply to all personnel and agencies called on to provide services at any fire defined as a "wildland fire."

(2) This section shall not apply to suppression actions taken on fires prior to the fire meeting the definition of a "wildland fire."

(3) Suppression personnel assigned to a wildland fire shall be trained to a NWCG Fire Fighter level II or a comparable class of training.

(a) "Comparable" training shall be determined by the employer.

(b) Nothing in this section shall preclude the use of local residents, affected parties or contracted fire fighting resources to suppress wildland fires if they are under the direct supervision of a qualified fire line officer.

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(4) Supervisory personnel shall be trained to a level commensurate to the position and responsibility they are to assume.

(5) All personnel will be trained and capable of demonstrating competency in utilizing the Incident Command System (ICS).

(6) All suppression personnel shall annually review the Standard Operating Safety Procedures. See Appendix D.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-07019, filed 5/10/96, effective 1/1/97.]

WAC 296-305-08000 Appendices. These appendices are nonmandatory and are included to reference and information purposes only.

Appendix A — Recommended cleaning procedures for protective turnout clothing and station uniforms. (1) Protective clothing should be washed separately from other garments.

(2) Do not use chlorine bleach (sodium hypochlorite) as this will adversely affect the tear strength of your protective clothing and lessen its life. Oxygenated bleaches such as Liquid Clorox II, and Vivid may be used.

(3) Protective clothing may be spot treated or pretreated for hard to remove stains with products such as liquid Spray and Wash, liquid Tide, liquid dishwashing detergent or liquid Shout.

Note: The use of brand names is intended only to indicate a type of cleaning agent. All products listed by name must be used in accordance with the manufacturer's recommendations. Use of a brand name does not constitute an endorsement nor does omission of a particular product brand imply that a product is inferior. Solvents should not be used as they lessen the life of the garment, reduce visibility on the trim, and degrade leather.

(4) When pretreating or spot treating a garment, apply the detergent onto the soiled area. Gently rub the fabric together until a light foam appears on the surface. Use a soft bristle brush (toothbrush type) and scrub the area for about one and one-half minutes. Reapply liquid detergent onto the soiled area and place the garment into the washing machine.

(5) When cleaning turnout clothing the garment should be turned inside out, the hooks and dees fastened, the liner removed, and the garment placed in a laundry bag. These instructions can be used for cleaning any wash loads in a large capacity (sixteen gallon) top loading or front loading machine. Load the machine with any one of the following combinations - do not overload:

- (a) One protective coat and one pair of trousers.
- (b) Two protective coats.
- (c) Two protective pair of trousers.

Note: Heavily soiled garments should be treated as outlined in (4).

(6) While the washing machine is filling with hot water (temperature between 120 degrees F and 130 degrees F), add one-half cup (four ounces) of liquid oxygenated bleach and one cup (eight ounces) of liquid detergent.

- (a) Fill washing machine to highest water level,
- (b) Add garments to be washed,
- (c) Set washing machine for normal cycle, cotton white, or similar setting.

(d) Machines should be programmed for a double rinse. If the machine will not automatically double rinse, a complete second cycle can be run without adding detergent or oxygenated bleach. Double rinse helps remove any residual dirt and ensures detergent removal.

(e) Remove garments from washing machine when done and dry by hanging in a shaded area that receives good cross ventilation, or hang on a line and use a fan to circulate air. A water extractor may be utilized.

(f) After the garments have been removed, run the laundry machine empty or with a dummy (rag) load with detergent at least once; but preferably several times to purge the machine of any residue.

(7) Inspect and examine the trim as to the effectiveness of the trim performance under daytime and nighttime conditions. It is important that a high visibility be maintained at all possible orientations to the light source.

(8) The above procedures can be used for any article of clothing issued that is not contaminated with bloodborne pathogens or any other infectious disease. For clothing exposed to hazardous materials, consult the manufacturer or the appropriate decontamination document.

(9) Procedure for clothing (except wool clothing) that has been exposed to bloodborne pathogens or infectious diseases.

(a) Disposable gloves should be used when handling contaminated clothing.

(b) Each station should have an area designated for the cleaning of equipment. The area designated should not be near kitchen, living, sleeping, or personal hygiene areas.

(c) Contaminated clothing should be handled as little as possible with a minimum of agitation. Contaminated clothing should be cleaned as soon as possible. When the on-coming shift has to clean contaminated clothing for the off-going shift, all contaminated clothing should be stored in red biohazard bags, properly sealed to prevent the spread of potential contamination.

(d) To clean clothing that has been contaminated, a germicidal detergent should be used. Such germicidal should be EPA approved and effective as staphylocidal, pseudomonacidal, virucidal, and fungicidal detergent.

(e) The germicidal detergent is intended to be a complete disinfecting and cleaning agent when mixed according to the manufacturer's directions. Do not add any chemical or detergent to the germicidal solution. After the clothing has been disinfected the clothing should be washed as outlined under normal use.

(f) Wool uniforms should be spot cleaned, placed in the red biohazard bags and sent to an industrial laundry for cleaning.

(10) Helmets, gloves, hoods, and boots should be cleaned as follows:

(a) Preclean using a germicidal solution and scrub all contaminated areas with a soft bristled brush. Rinse with clean water. Dispose of the precleaning solution by pouring it down the drain in the cleaning area.

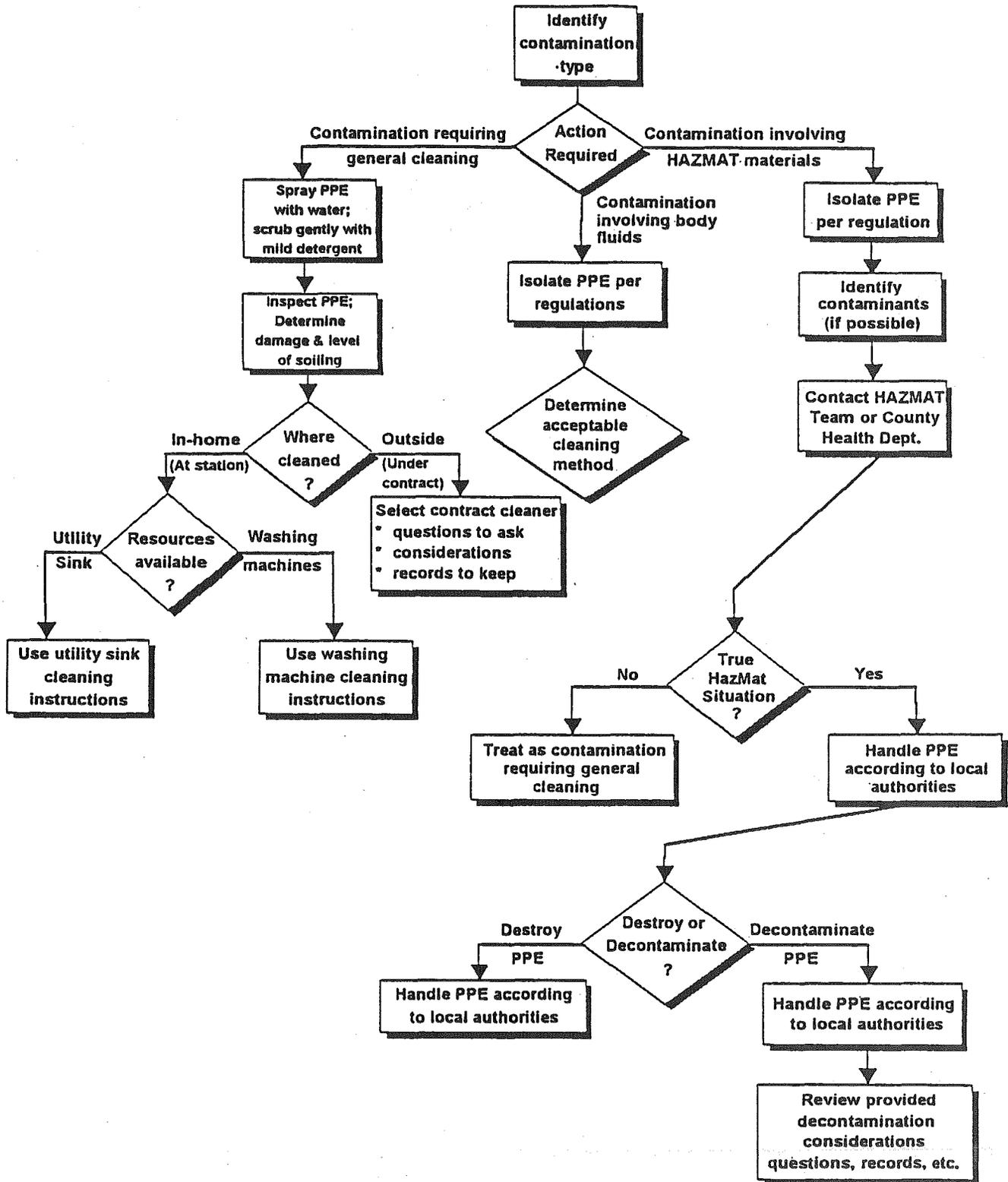
(b) Using a fresh germicidal solution, repeat the above procedure allowing the areas to remain wet for a minimum of fifteen minutes. Double rinse with clean water and air dry.

Dispose of the solution by pouring it down the drain in the cleaning area.

(c) For gloves, use a third fresh water rinse, squeezing and rinsing several times. Dispose of the solution by pouring it down the drain in the cleaning area.

(11) Front loading industrial laundry machines are designed for the type of cleaning required for protective clothing. Machines are available from Milnor, Model 30015C6M-AAAC, for washing; or a Huabsch Originator, Model 3705H, for a dryer.

Note: The use of brand names is intended only to indicate a type of cleaning equipment. All products listed by name must be used in accordance with the manufacturer's recommendations. Use of a brand name does not constitute an endorsement nor does omission of a particular product brand imply that a product is inferior.



PPE Cleaning and Decontamination Decision-Making Process

Appendix B —Life safety ropes. (1) Life safety rope may be significantly weakened by abrasion, misuse, contam-

ination, wear, and stresses approaching its breaking strength, particularly impact loading. Since there are no approved

methods to service test a rope without compromising its strength, rope rescue and training operations should be carefully observed and monitored for conditions that could cause immediate failure or result in undetectable damage to the rope.

(2) If a rope has been used in a situation that could not be supervised or where potential damage may have occurred, it must be removed from service and destroyed.

(3) It is important that ropes be inspected for signs of wear by qualified individuals after each use. If indication of wear or damage are noted, or if the rope has been stressed in excess of the manufacturer's recommendation or impact loaded, it must be destroyed.

(4) The destruction of the rope means that it must be removed from service and altered in such a manner that it could not be mistakenly used as a life safety rope. This alteration could include disposing of the rope, or removal of identifying labels and attachments, and cutting the rope into short lengths that could be used for utility purposes.

(5) The assignment of "disposable" life safety ropes to members or to vehicles has proved to be an effective system to manage ropes that are provided for emergency use and are used infrequently. Special rescue teams, which train frequently and use large quantities of rope, should include members who are qualified to manage and evaluate the condition of their ropes and determine the limitations upon their reuse.

Appendix C — Decontamination. (1) A decontamination area should be established whenever civilians or fire department personnel have had known or suspected exposure to toxic chemicals.

(2) Such decontamination areas should be established before any personnel are allowed to enter the "Hot" zone.

(3) The decontamination area should be set up using the following guidelines:

(a) The decontamination area should be located uphill, upwind and at a right angle to the "Hot" zone.

(b) The decontamination area entry/exit point and boundaries should be clearly marked using flagging tape, ropes, cones, etc.

(3) Visqueene should be spread on the ground in the decontamination area to control runoff.

(4) The decontamination process is divided into stations. In most cases it will not be necessary to utilize all the stations. The decision to use all or part of the stations should be based on the following factors:

(a) The hazards associated with the product involved.

(b) The estimated levels of contamination.

(c) The type of protective equipment worn by contaminated responders.

(d) Recommendations from outside sources such as, but not limited to CHEMTREC, the agency for toxic substance and disease registry, poison control centers or the manufacturer of the product.

(5) The following is a list of all the stations in a nine-step decontamination area set up for a worst case scenario involving a hazardous materials response team member whose chemical suit has been breached:

(a) Station #1 - Segregated equipment drop: Contaminated equipment that will be used again in the "Hot" zone,

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disposed of, or decontaminated at a later time or place, will be deposited here.

(b) Station #2 - Wash/rinse: Entry personnel will be washed with appropriate decontamination solution and rinsed with water by attendant(s) to remove gross contamination. This station may consist of multiple wash/rinse steps depending on the severity of the hazards involved.

(c) Station #3 - Outer protective clothing removal: Attendant(s) will remove the outer protective clothing from entry personnel being cautious to avoid touching the inside of the suit while removing it. Protective clothing that has been removed at this step shall be placed in an overpack or other appropriate container for later testing and further decontamination, if needed.

(d) Station #4 - Removal of SCBA: The entry personnel are assisted in removing their SCBA by an attendant. The SCBA facepiece should be left in place and the low pressure hose held away from any potentially contaminated inner clothing.

(e) Station #5 - Removal of inner clothing: All clothing worn inside the suit must be removed in cases where the suit has been penetrated and the entry personnel are contaminated.

(f) Station #6 - Personal shower: Entry personnel should wash and rinse entire body with mild soap and water. Contain runoff water if possible, however this is an emergency situation and containment is secondary to removing contaminants from personnel.

(g) Station #7 - Drying off: Entry personnel that have showered should dry off using towels or whatever is available. Items used should be placed in an appropriate container for disposal. Emergency clothing such as disposable coveralls should be provided.

(h) Station #8 - Medical evaluation: Entry personnel should be evaluated by paramedics - checking vital signs including temperature and level of consciousness. Records of the evaluation must be kept and given to the team safety officer to be included in the members exposure records.

(i) Station #9 - Transport to emergency room: Any personnel exhibiting any signs or symptoms of exposure should be transported to the emergency room for evaluation and observation.

(6) The hazardous materials response team van should carry premeasured packets of decontamination solution mixes for the purpose of decontaminating chemical protective clothing and other equipment at the scene of a hazardous materials emergency. These solutions are not to be used to decontaminate turnouts or exposed skin under any circumstances.

(7) The primary solution used will be a simple detergent and water mixture. Other special decontamination solution mixes will only be used in those situations when it is determined that the detergent and water solution is inappropriate.

(8) Contaminated civilians that are exhibiting signs or symptoms of exposure should be treated as patients. Due to the risk of secondary contamination, all patients should undergo emergency field decontamination at the scene before being evaluated by medical personnel or being transported to the emergency room. Medical personnel should not accept any patient that has not been grossly decontaminated.

(9) The emergency field decontamination process should consist of removing the clothing from all affected body parts of the exposed person and flushing with copious quantities of water from a garden hose or low pressure one and three-quarter inch handline to remove gross contamination. Patients will be flushed for up to fifteen minutes, depending on the material recommendations on patient decontamination.

(10) Members performing patient decontamination should wear, at a minimum, full turnouts and SCBA and should avoid splashes and overspray to the extent possible. They should also undergo decontamination when they have finished decontaminating the patient.

(11) Containment of the runoff water from patient decontamination is not required. Do not delay decontamination of patients to set up containment. However, some form of privacy screen should be erected to protect the modesty of those being decontaminated.

(12) Responders that are contaminated in the process of performing rescue or other tasks will, at the minimum, be flushed with water for a minimum of one minute. Further flushing will be performed depending on the extent of contamination and subsequent adverse health effects.

Appendix D—Wildland Fire Fighting Equipment Typings.

PUMP RATE GMP MINIMUM	TANK CAPACITY IN GALLONS
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PUMPER/BRUSH ENGINE:

ICS Type 7	20	125
ICS Type 6	50	200
ICS Type 5	50	500
ICS Type 4	70	750
ICS Type 3	120	300

PUMPER/CLASS A RATED:

ICS Type 2	500	400
ICS Type 1	1000	400

- Ten standard fire orders
- Fight fire aggressively but provide for safety first.
- Initiate all action based on current and expected fire behavior.
- Recognize current weather conditions and obtain forecasts.
- Ensure instructions are given and understood.
- Obtain current information on fire status.
- Remain in communication with crew members, your supervisor, and adjoining forces.
- Determine safety zones and escape routes.
- Establish lookouts in potentially hazardous situations.
- Retain control at all times.
- Stay alert, keep calm, think clearly, act decisively.

Four common denominators of tragedy fires

1. Small fires or relatively quiet sectors of large fires.
2. Light fuels.
3. Steep slopes.
4. Change in wind speed and/or direction.

"Watch Out" Situations

1. Fire not scouted and sized up.
2. In country not seen in daylight.
3. Safety zones and escape routes not identified.
4. Unfamiliar with weather and local factors influencing fire behavior.
5. Uninformed on strategy, tactics and hazards.
6. Instructions and assignments not clear.

7. No communication link with crew members or supervisor.
8. Constructing line without safe anchor point.
9. Building fire line downhill with fire below.
10. Attempting frontal assault on fire.
11. Unburned fuel between you and fire.
12. Cannot see main fire, not in contact with someone who can.
13. On a hillside where rolling material can ignite fuel below.
14. Weather becoming hotter and drier.
15. Wind increases and/or changes direction.
16. Getting frequent spot fires across line.
17. Terrain and fuels make escape to safety zones difficult.
18. Taking nap near fire line.

National Wildlife Coordinating Group Fire Fighter II Performance Tasks

1. Agency policy for wildfires.
2. Extended attack fire orientation and dispatch.
3. Inmate orientation.
4. Fire line organization.
5. Tools and equipment.
6. Firing devices.
7. Wildland water delivery systems and pump use.
8. Introduction to wildland fire behavior.
9. Fire line safety.
10. Size up and initial attack.

11. Fire line construction.
12. Wildland fire investigation.
13. Structure protection.
14. Use of foam.
15. Mop up.
16. Compass use.
17. Map use.
18. Radio communications.
19. Incident command system.
20. Basic first-aid.
21. Hazardous materials awareness.

Appendix E—Standard apparatus operation communications.

When fire fighters ride in the tiller's seat or other remote location, an electrical signal or voice communication should be installed between the tiller's seat, work station, and driver's compartment.

(1) These signals should be used between the driver and the fire fighters:

- (a) One long buzz means stop;
- (b) Two buzzes mean forward;
- (c) Three buzzes mean reverse.

(2) Before any of the above functions are undertaken, with the exception of stopping, the same signal must be both sent and received. The driver should not act without sending and receiving a confirming signal.

(3) When using hand signals, these signals are as follows:

STOP

Hold hand to the side, shoulder high, exposing palm to the driver. At night, hold hands in the same manner, with the addition of a flashlight in one hand shining at the driver. This will indicate an immediate STOP.



STOP

Hold hand to the side, shoulder high, exposing palm to the driver. At night, hold hands in the same manner, with the addition of a flashlight in one hand shining at the driver. This will indicate an immediate STOP.

RIGHT OR LEFT

Point in the desired direction with one hand and motion in a circular "come-on" gesture with the other hand at the

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chest level. At night direct a flashlight beam at the hand pointing in the desired direction.



RIGHT OR LEFT

Point in the desired direction with one hand and motion in a circular "come on" gesture with other at the chest level. At night, direct a flashlight beam at the hand pointing in the desired direction.

DIMINISHING CLEARANCE

Hold the hands to one side of the body indicating the approximate amount of distance the apparatus is from the obstacle. Close hands accordingly as the driver slowly maneuvers the apparatus to point where the signal indicates immediate STOP. Always allow enough for drivers reaction time.

At night, indicate in the same manner with the flashlight in the upper hands and beam directed at the palm of the other. On STOP, cover the flashlight beam with the hands.



DIMINISHING CLEARANCE

Hold the hands to one side of the body indicating the approximate amount of distance the apparatus is from the obstacle. Close hands accordingly as the driver slowly maneuvers the apparatus to point where the signal indicates immediate STOP. Always allow enough for divers reaction time. At night, indicate in the same manner with the flashlight in the upper hands and beam directed at the palm of the other. On STOP, cover the flashlight beam with the hands.

[Title 296 WAC—p. 2487]

AHEAD OR BACK-UP

Hold hand directly in front, chest high, fingers on hands directed toward one another, and motion in a circular "come-on" gesture. At night hold a flashlight in one hand and direct the beam toward the other.



AHEAD OR BACK UP

Hold hand directly in front, chest high, fingers on hands directed toward one another, and motion in circular "come-on" gesture. At night hold a flashlight in one hand and direct the beam toward the other.

[Statutory Authority: RCW 49.17.010, [49.17].050 and [49.17].060. 96-11-067, § 296-305-08000, filed 5/10/96, effective 1/1/97.]

Chapter 296-307 WAC

SAFETY STANDARDS FOR AGRICULTURE

WAC

FIELD OPERATIONS AND GENERAL REQUIREMENTS

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- 296-307-006 What does this chapter cover?
- 296-307-009 What definitions apply to this chapter?
- 296-307-012 What does it mean when equipment is approved by a nonstate organization?
- 296-307-015 What must an employer do if a serious injury occurs?
- 296-307-018 What are the employer's responsibilities?
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- 296-307-036 What items go on the safety bulletin board?
- 296-307-039 How many people at the worksite must be first-aid trained?
- 296-307-042 Must an employer provide first-aid kits?
- 296-307-045 What are the requirements of the safe place standard?

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- 296-307-050 What requirements apply to hand tools?

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Pits, and Trenches

- 296-307-055 Ladders.
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- 296-307-05503 How must an employer instruct employees to use ladders?
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- 296-307-05507 What other requirements apply to ladders?
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- 296-307-061 What requirements apply to working around bins, bunkers, hoppers, tanks, pits, and trenches?

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- 296-307-065 How must slow-moving vehicles be marked?
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- 296-307-07001 How must motor vehicles be maintained?
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Rollover Protective Structures (ROPS) for Tractors

- 296-307-080 Rollover protective structures (ROPS) for tractors.
- 296-307-08003 Which agricultural tractors are covered by this section?
- 296-307-08006 What definitions apply to rollover protective structures (ROPS) for agricultural tractors?
- 296-307-08009 What requirements apply to the testing and performance of ROPS used on agricultural tractors?
- 296-307-08012 What requirements apply to seatbelts used with ROPS on agricultural tractors?
- 296-307-08015 When are ROPS not required on agricultural tractors?
- 296-307-08018 What employee training requirements apply to ROPS used on agricultural tractors?
- 296-307-08021 What other requirements apply to ROPS used on agricultural tractors?
- 296-307-085 When must ROPS be provided for material handling equipment?
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- 296-307-107 Federal worker protection standards—Washington state department of agriculture.
- 296-307-110 Scope and purpose—Worker protection standards—40 CFR, § 170.1.
- 296-307-11005 Definitions—Worker protection standards—40 CFR, § 170.3.
- 296-307-11010 General duties and prohibited actions—Worker protection standards—40 CFR, § 170.7.

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296-307-120	Applicability of this section—Standards for workers—40 CFR, § 170.102.	296-307-16005	What requirements apply to the water supply?
296-307-12005	Exceptions—Standards for workers—40 CFR, § 170.103.	296-307-16007	Must an employer provide toilet facilities for the camp?
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296-307-12015	Restrictions associated with pesticide applications—Standards for workers—40 CFR, § 170.110.	296-307-16011	What facilities must an employer provide for laundry, handwashing, and bathing?
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296-307-130	Applicability of this section—Standards for pesticide handlers—40 CFR, § 170.202.	296-307-18015	What training must an employer provide for employees who use agricultural equipment?
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296-307-13020	Notice of applications to agricultural employers—Standards for pesticide handlers—40 CFR, § 170.224.		
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296-307-28024	What requirements apply to guarding vertical and inclined belts?	296-307-330	Safety color coding; accident prevention signs and tags.
296-307-28026	What requirements apply to guarding cone-pulley belts?	296-307-33001	What definitions apply to this section?
296-307-28028	What requirements apply to guarding belt tighteners?	296-307-33003	What does red identify in safety color coding?
296-307-28030	What requirements apply to guarding gears, sprockets, and chains?	296-307-33005	What does yellow identify in safety color coding?
296-307-28032	What requirements apply to guarding friction drives?	296-307-33007	When should signs and tags use "danger" versus "caution"?
296-307-28034	What requirements apply to guarding keys, set screws, and other projections?	296-307-33009	What are the design and color specifications for accident prevention signs?
296-307-28036	What requirements apply to guarding collars and couplings?		
296-307-28038	Must self-lubricating bearings be used?		
296-307-28040	What requirements apply to guarding clutches, cutoff couplings, and clutch pulleys?		
296-307-28042	What requirements apply to guarding belt shifters, clutches, shippers, poles, perches, and fasteners?		
296-307-28044	What materials must be used for standard guards?		

296-307-33011	What are the proper uses of accident prevention tags?	296-307-36636	How must high voltage systems be grounded?
	Part S	296-307-368	Wiring methods, components, and equipment for general use.
	Fire Protection and Ignition Sources; Exit Routes	296-307-36803	Does this section apply to factory-assembled equipment?
296-307-340	Portable fire extinguishers.	296-307-36806	What wiring methods must be used for temporary wiring?
296-307-34003	What does this section cover?	296-307-36809	When may cable trays be used?
296-307-34006	Who is exempt from the requirements of this section?	296-307-36812	What requirements apply to open wiring on insulators?
296-307-34009	What general requirements apply to portable fire extinguishers?	296-307-36815	What wiring requirements apply to cabinets, boxes, and fittings?
296-307-34012	How should portable fire extinguishers be selected and distributed?	296-307-36818	What requirements apply to switches?
296-307-34015	What are the requirements for inspection, maintenance and testing of portable fire extinguishers?	296-307-36821	Where must switchboards and panelboards be located?
296-307-34018	What requirements apply to hydrostatic testing?	296-307-36824	When must conductors be insulated?
296-307-34021	What are the training requirements for portable fire extinguishers?	296-307-36827	When may flexible cords and cables be used?
296-307-345	Employee alarm systems.	296-307-36830	How must flexible cords and cables be identified, spliced, and terminated?
296-307-34503	What does this section cover?	296-307-36833	What requirements apply to multiconductor portable cable?
296-307-34506	What general requirements apply to employee alarm systems?	296-307-36836	When may fixture wires be used?
296-307-34509	What are the installation and restoration requirements for employee alarm systems?	296-307-36839	What requirements apply to wiring for lighting fixtures, lampholders, lamps, and receptacles?
296-307-34512	How must employee alarm systems be maintained and tested?	296-307-36842	What requirements apply to wiring for receptacles, cord connectors, and attachment plugs (caps)?
296-307-34515	Where must manually operated devices be located?	296-307-36845	What requirements apply to wiring for appliances?
296-307-350	Exit routes.	296-307-36848	What requirements apply to wiring for motors, motor circuits, and controllers?
296-307-35003	What does this section cover?	296-307-36851	What requirements apply to wiring for transformers?
296-307-35006	What definitions apply to this section?	296-307-36854	What requirements apply to wiring for capacitors?
296-307-35009	What are the design requirements for exit routes?	296-307-36857	How must storage batteries be ventilated?
296-307-35012	What are the operation and maintenance requirements for exit routes?	296-307-36860	What other miscellaneous requirements apply to wiring methods?
296-307-35015	What are the requirements for an emergency action plan?	296-307-370	Special purpose equipment and installations.
296-307-35018	What are the requirements for a fire prevention plan?	296-307-37003	What requirements apply to cranes, hoists, and runways?
	Part T	296-307-37006	What requirements apply to elevators, dumbwaiters, escalators, and moving walks?
	Electrical	296-307-37009	What requirements apply to the disconnecting means for electric welders?
296-307-360	Electrical.	296-307-37012	What requirements apply to electrically driven or controlled irrigation machines?
296-307-36005	What does this part cover?	296-307-372	Hazardous (classified) locations.
296-307-36010	What definitions apply to this part?	296-307-37203	What does this section cover?
296-307-362	General electrical requirements.	296-307-37206	What classifications apply to this section?
296-307-36203	What electrical equipment must be approved?	296-307-37209	What equipment, wiring methods, and installations may be used in hazardous locations?
296-307-36206	How must electrical equipment safety be determined?	296-307-37212	How must conduit be installed in hazardous locations?
296-307-36209	What requirements apply to guarding live parts?	296-307-37215	Which equipment may be used in Division 1 and 2 locations?
296-307-36212	What workspace must be provided?	296-307-37218	What requirements apply to motors and generators used in hazardous locations?
296-307-36215	What general requirements apply to splices?	296-307-374	Special systems.
296-307-36218	What protection must be provided against combustible materials?	296-307-37403	What requirements apply to systems over 600 volts, nominal?
296-307-36221	How must electrical equipment be marked?	296-307-37406	What requirements apply to emergency power systems?
296-307-36224	How must disconnecting means be marked?	296-307-37409	How are Class 1, Class 2, and Class 3 remote control, signaling, and power-limited circuits classified?
296-307-36227	What access and working space must be provided for electrical equipment of 600 volts, nominal, or less?	296-307-37412	What requirements apply to fire protective signaling systems?
296-307-36230	What access and working space must be provided for electrical equipment over 600 volts, nominal?	296-307-376	Working on or near exposed energized parts.
296-307-364	Electrical installation and maintenance.	296-307-37603	What does this section cover?
296-307-36403	How must flexible cords and cables be installed and maintained?	296-307-37606	Who may work on energized parts?
296-307-36406	How must attachment plugs and receptacles be installed and maintained?	296-307-37609	What requirements apply to working near low voltage lines?
296-307-36409	What must employees do when equipment causes electrical shock?	296-307-37612	What requirements apply to qualified persons working near overhead lines?
296-307-36412	What grounding and bonding requirements apply to equipment installation and maintenance?	296-307-37615	What requirements apply to vehicles and mechanical equipment near overhead lines?
296-307-36415	What requirements apply to disconnecting means?	296-307-37618	What lighting must be provided for employees working near exposed energized parts?
296-307-36418	What requirements apply to identification and load rating of electrical equipment?	296-307-37621	What requirements apply to working near exposed energized parts in confined spaces?
296-307-36421	How must equipment be installed in wet locations?	296-307-37624	What housekeeping requirements apply to working near exposed energized parts?
296-307-366	Wiring design and protection.	296-307-37627	Who may defeat an electrical safety interlock?
296-307-36603	How must grounded and grounding conductors be used and identified?	296-307-378	Safety-related work practices.
296-307-36606	What ampere rating must outlet devices have?	296-307-37801	What does this section cover?
296-307-36609	What requirements apply to conductors?	296-307-37803	How must employees be trained on safety practices?
296-307-36612	What design and protection requirements apply to service-entrances?	296-307-37805	How must safety-related work practices be chosen and used?
296-307-36615	What overcurrent protection must be provided?	296-307-37807	What work practices must be followed for work on exposed deenergized parts?
296-307-36618	What premises wiring systems must be grounded?	296-307-37809	Must an employer have a written copy of lockout-tagout procedures?
296-307-36621	Must the conductor be grounded for AC premises wiring?		
296-307-36624	What general requirements apply to grounding conductors?		
296-307-36627	Must the path to ground be continuous?		
296-307-36630	What supports, enclosures, and equipment must be grounded?		
296-307-36633	How must fixed equipment be grounded?		

296-307-37811	What work practices must be followed for deenergizing equipment?	296-307-41025	What requirements apply to safety devices?
296-307-37813	How must locks and tags be applied?	296-307-41027	How must indirect fired vaporizers be constructed and installed?
296-307-37815	What work practices must be followed to verify deenergization?	296-307-41029	How must atmospheric vaporizers be constructed and installed?
296-307-37817	What work practices must be followed when reenergizing equipment?	296-307-41031	How must direct gas-fired vaporizers be constructed and installed?
296-307-37819	What safety-related work practices relate to portable electric equipment?	296-307-41033	How must direct gas-fired tank heaters be constructed and installed?
296-307-37821	What safety-related work practices relate to electric power and lighting circuits?	296-307-41035	How must dehydrators be constructed and installed?
296-307-37823	What safety-related work practices relate to test instruments and equipment?	296-307-41037	What are the maximum filling densities?
296-307-37825	What safety-related work practices relate to flammable materials?	296-307-41039	What requirements apply to LP-gas in buildings?
296-307-380	Electrical protective equipment.	296-307-41041	What requirements apply to transfer of liquids?
296-307-38003	How must protective equipment be used?	296-307-41043	Must workers be trained?
296-307-38006	What requirements apply to general protective equipment and tools?	296-307-41045	What fire protection must be provided for LP-gas installations?
296-307-38009	What manufacturing and marking requirements apply to electrical protective devices?	296-307-41047	What electrical requirements apply to LP-gas installations?
296-307-38012	What electrical requirements apply to electrical protective devices?	296-307-41049	What requirements apply to liquid-level gauging devices?
296-307-38015	What workmanship and finish requirements apply to electrical protective devices?	296-307-41051	What requirements apply to appliances?
296-307-38018	How must electrical protective devices be maintained and used?	296-307-415	Cylinder systems.
		296-307-41501	What does this section cover?
		296-307-41503	What is a "cylinder system?"
		296-307-41505	How must containers be marked for cylinder systems?
		296-307-41507	What additional requirements apply to cylinder systems installed outdoors?
		296-307-41509	What additional requirements apply to cylinder system installed indoors?
		296-307-41511	What requirements apply to valves and accessories?
		296-307-41513	What requirements apply to safety devices for cylinder systems?
		296-307-41515	What other requirements apply to cylinder systems?
		296-307-420	Systems using non-DOT containers.
		296-307-42001	What does this section cover?
		296-307-42003	How must non-DOT containers be designed and classified?
		296-307-42005	What requirements apply to valves and accessories, filler pipes, and discharge pipes for non-DOT containers?
		296-307-42007	What additional requirements apply to safety devices for non-DOT containers?
		296-307-42009	When may non-DOT containers be reinstalled?
		296-307-42011	What is the maximum capacity allowed for non-DOT containers?
		296-307-42013	How must non-DOT containers be installed?
		296-307-42015	How must non-DOT containers be protected?
		296-307-42017	What requirements apply to non-DOT containers in industrial plants?
		296-307-42019	What requirements apply to container-charging plants?
		296-307-42021	What fire protection must be provided for non-DOT containers?
		296-307-42023	What other requirements apply to non-DOT containers?
		296-307-425	LP-gas as a motor fuel.
		296-307-42501	What does this section cover?
		296-307-42503	What general requirements apply to LP-gas used as a motor fuel?
		296-307-42505	How must fuel containers be designed and classified?
		296-307-42507	How must fuel containers be installed?
		296-307-42509	What requirements apply to valves and accessories?
		296-307-42511	What requirements apply to piping, tubing, and fittings?
		296-307-42513	What requirements apply to safety devices?
		296-307-42515	What requirements apply to vaporizers?
		296-307-42517	What requirements apply to gas regulating and mixing equipment?
		296-307-42519	What is the maximum container capacity allowed?
		296-307-42521	What requirements apply to stationary engines used indoors?
		296-307-42523	What requirements apply to portable engines used indoors?
		296-307-42525	What requirements apply to industrial trucks used indoors?
		296-307-42527	How must LP-gas-fueled vehicles be garaged?
		296-307-430	Storage of containers awaiting use or resale.
		296-307-43001	What does this section cover?
		296-307-43003	What general requirements apply to storage of containers?
		296-307-43005	How must containers be stored within buildings frequented by the public?
		296-307-43007	How must containers be stored in buildings not frequented by the public?
		296-307-43009	How must containers be stored within special buildings or rooms?
		296-307-43011	How must containers be stored outdoors?

SPECIALIZED OPERATIONS

Part U-1

Hazardous Materials—Anhydrous Ammonia

296-307-400	Anhydrous ammonia.	296-307-41515	What other requirements apply to cylinder systems?
296-307-40001	What does this section cover?	296-307-420	Systems using non-DOT containers.
296-307-40003	What definitions apply to this section?	296-307-42001	What does this section cover?
296-307-40005	What general requirements apply to the storage and handling of anhydrous ammonia?	296-307-42003	How must non-DOT containers be designed and classified?
296-307-40007	What requirements apply to systems mounted on farm wagons (implements of husbandry) for the transportation of ammonia?	296-307-42005	What requirements apply to valves and accessories, filler pipes, and discharge pipes for non-DOT containers?
296-307-40009	What requirements apply to systems mounted on farm wagons (implements of husbandry) for the application of ammonia?	296-307-42007	What additional requirements apply to safety devices for non-DOT containers?
296-307-40011	What requirements must approved anhydrous ammonia equipment meet?	296-307-42009	When may non-DOT containers be reinstalled?
296-307-40013	What requirements apply to the construction, original test, and requalification of nonrefrigerated containers?	296-307-42011	What is the maximum capacity allowed for non-DOT containers?
296-307-40015	How must nonrefrigerated containers and systems (other than DOT containers) be marked?	296-307-42013	How must non-DOT containers be installed?
296-307-40017	Where may anhydrous ammonia containers be located?	296-307-42015	How must non-DOT containers be protected?
296-307-40019	What requirements apply to container accessories?	296-307-42017	What requirements apply to non-DOT containers in industrial plants?
296-307-40021	What requirements apply to piping, tubing, and fittings?	296-307-42019	What requirements apply to container-charging plants?
296-307-40023	What specifications must hoses meet?	296-307-42021	What fire protection must be provided for non-DOT containers?
296-307-40025	What requirements apply to safety-relief devices?	296-307-42023	What other requirements apply to non-DOT containers?
296-307-40027	What emergency precautions are required when handling anhydrous ammonia?	296-307-425	LP-gas as a motor fuel.
296-307-40029	What requirements apply to filling densities?	296-307-42501	What does this section cover?
296-307-40031	What requirements apply to the transfer of liquids?	296-307-42503	What general requirements apply to LP-gas used as a motor fuel?
296-307-40033	What requirements apply to tank car unloading points and operations?	296-307-42505	How must fuel containers be designed and classified?
296-307-40035	What requirements apply to the liquid-level gauging device?	296-307-42507	How must fuel containers be installed?
296-307-40037	How should aboveground uninsulated containers be maintained?	296-307-42509	What requirements apply to valves and accessories?
296-307-40039	What requirements apply to electrical equipment and wiring?	296-307-42511	What requirements apply to piping, tubing, and fittings?
		296-307-42513	What requirements apply to safety devices?
		296-307-42515	What requirements apply to vaporizers?
		296-307-42517	What requirements apply to gas regulating and mixing equipment?
		296-307-42519	What is the maximum container capacity allowed?
		296-307-42521	What requirements apply to stationary engines used indoors?
		296-307-42523	What requirements apply to portable engines used indoors?
		296-307-42525	What requirements apply to industrial trucks used indoors?
		296-307-42527	How must LP-gas-fueled vehicles be garaged?
		296-307-430	Storage of containers awaiting use or resale.
		296-307-43001	What does this section cover?
		296-307-43003	What general requirements apply to storage of containers?
		296-307-43005	How must containers be stored within buildings frequented by the public?
		296-307-43007	How must containers be stored in buildings not frequented by the public?
		296-307-43009	How must containers be stored within special buildings or rooms?
		296-307-43011	How must containers be stored outdoors?

Part U-2

Hazardous Materials—Liquefied Petroleum Gas

296-307-410	Storage and handling of liquefied petroleum gases.	296-307-42523	What requirements apply to portable engines used indoors?
296-307-41001	What does this part cover?	296-307-42525	What requirements apply to industrial trucks used indoors?
296-307-41003	Which LP-gas installations are not covered by this part?	296-307-42527	How must LP-gas-fueled vehicles be garaged?
296-307-41005	What definitions apply to this part?	296-307-430	Storage of containers awaiting use or resale.
296-307-41007	When must LP-gas be odorized?	296-307-43001	What does this section cover?
296-307-41009	Must LP-gas containers and equipment be approved?	296-307-43003	What general requirements apply to storage of containers?
296-307-41011	What construction and test requirements must containers meet?	296-307-43005	How must containers be stored within buildings frequented by the public?
296-307-41013	How must containers be welded?	296-307-43007	How must containers be stored in buildings not frequented by the public?
296-307-41015	How must containers be marked?	296-307-43009	How must containers be stored within special buildings or rooms?
296-307-41017	Where must containers be located?	296-307-43011	How must containers be stored outdoors?
296-307-41019	What requirements apply to valves and accessories?		
296-307-41021	What requirements apply to piping, tubing, and fittings?		
296-307-41023	What specifications must hoses meet?		

296-307-43013	What fire protection must be provided for stored containers?	296-307-48019	What requirements apply to cylinder valves?
296-307-435	LP-gas system installations on commercial vehicles.	296-307-48021	What requirements apply to cylinder regulators?
296-307-43501	What does this section cover?	296-307-48023	What requirements apply to fuel-gas manifolds?
296-307-43503	How must containers be constructed?	296-307-48025	What requirements apply to high pressure oxygen manifolds?
296-307-43505	What is the maximum capacity allowed for LP-gas installations on commercial vehicles?	296-307-48027	What requirements apply to low pressure oxygen manifolds?
296-307-43507	Where must systems be located?	296-307-48029	What requirements apply to manifolding portable outlet headers?
296-307-43509	What requirements apply to valves and accessories?	296-307-48031	What operating procedures apply to cylinder manifolds?
296-307-43511	What requirements apply to safety devices?	296-307-48033	How must service piping systems be designed?
296-307-43513	What types of systems may be used on commercial vehicles?	296-307-48035	What requirements apply to piping joints?
296-307-43515	What requirements apply to enclosures and mounting?	296-307-48037	How must service piping systems be installed?
296-307-43517	What requirements apply to piping, tubing, and fittings?	296-307-48039	How must service piping systems be painted and marked?
296-307-43519	What requirements apply to appliances?	296-307-48041	How must service piping systems be tested?
296-307-43521	What general precautions must be followed for LP-gas system installations on commercial vehicles?	296-307-48043	How must equipment be installed?
296-307-43523	How must containers be charged?	296-307-48045	How must service piping systems be protected?
296-307-43525	What fire protection must be provided for mobile cook units?	296-307-48047	What requirements apply to piping protective equipment?
296-307-440	LP-gas service stations.	296-307-48049	What requirements apply to station outlet protective equipment?
296-307-44001	What does this section cover?	296-307-48051	What requirements apply to hose and hose connections?
296-307-44003	How must storage containers be designed and classified?	296-307-48053	What requirements apply to pressure-reducing regulators?
296-307-44005	What requirements apply to valves and accessories?	296-307-485	Installation and operation of resistance welding equipment.
296-307-44007	What requirements apply to safety devices?	296-307-48501	What general requirements apply to resistance welding equipment?
296-307-44009	What is the maximum capacity allowed for containers?	296-307-48503	What requirements apply to portable welding machines?
296-307-44011	How must storage containers be installed?	296-307-48505	What requirements apply to flash welding equipment?
296-307-44013	What equipment must be protected against tampering?	296-307-48507	Who must perform a job hazard analysis?
296-307-44015	What requirements apply to the transport truck unloading point?	296-307-48509	What maintenance requirements apply to resistance welding equipment?
296-307-44017	What requirements apply to piping, valves, and fittings?	296-307-490	Application, installation, and operation of arc welding and cutting equipment.
296-307-44019	What requirements apply to pumps and accessory equipment?	296-307-49001	What environmental conditions must be taken into account when selecting arc welding equipment?
296-307-44021	What requirements apply to LP-gas dispensing devices?	296-307-49003	What voltages must arc welding equipment use?
296-307-44023	Is smoking allowed at LP-gas service stations?	296-307-49005	How must arc welding equipment be designed?
296-307-44025	What fire protection must be provided at LP-gas service stations?	296-307-49007	How must arc welding equipment be installed?
	Part U-3	296-307-49009	How must arc welding equipment be grounded?
	Other Hazardous Materials	296-307-49011	What requirements apply to supply connections and conductors?
296-307-450	Other hazardous materials.	296-307-49013	How must arc welding equipment be operated?
296-307-45001	What general requirements apply to hazardous materials and flammable and combustible liquids?	296-307-49015	How must arc welding equipment be maintained?
296-307-45003	What requirements apply to dip tanks containing flammable or combustible liquids?	296-307-495	Fire prevention and protection.
296-307-45005	What definitions apply to this section?	296-307-49501	What basic fire prevention precautions must be taken?
296-307-45007	What requirements must ventilation systems meet?	296-307-49503	What special fire prevention precautions must be taken?
296-307-45009	What general requirements apply to the construction of dip tanks?	296-307-49505	What precautions must be taken when welding or cutting containers?
296-307-45011	How must overflow pipes for dip tanks be constructed?	296-307-49507	What precautions must be taken when welding in confined spaces?
296-307-45013	How must the bottom drains of dip tanks be constructed?	296-307-500	Protection of employees.
296-307-45015	How must liquids used in dip tanks be stored and handled?	296-307-50001	How must eye protection be selected?
296-307-45017	What measures must an employer take to prevent hazards from electrical and other ignition sources?	296-307-50003	What specifications must eye protection meet?
296-307-45019	How must dip tanks be operated and maintained?	296-307-50005	What protective clothing must welders wear?
296-307-45021	What requirements must fire extinguishing systems meet?	296-307-50007	What other requirements apply to employee protection?
296-307-45023	What requirements apply to hardening and tempering tanks?	296-307-50009	What employee protection must be provided in confined spaces?
296-307-45025	What requirements apply to flow coat applications?	296-307-50011	What general requirements apply to welding ventilation?
296-307-45027	What requirements apply to electrostatic apparatus?	296-307-50013	What ventilation must be provided for general welding and cutting?
296-307-45029	What requirements apply to roll coating applications?	296-307-50015	What requirements apply to local exhaust hoods and booths?
	Part V	296-307-50017	What ventilation must be provided in confined spaces?
	Welding	296-307-50019	What requirements apply to welding fluorine compounds?
296-307-475	Welding, cutting, and brazing.	296-307-50021	What requirements apply to welding zinc?
296-307-47501	What definitions apply to this part?	296-307-50023	What requirements apply to welding lead?
296-307-480	Installation and operation of oxygen fuel gas systems for welding and cutting.	296-307-50025	What requirements apply to welding beryllium?
296-307-48001	What general requirements apply to oxygen fuel gas systems?	296-307-50027	What requirements apply to welding cadmium?
296-307-48003	What requirements apply to portable cylinders?	296-307-50029	What requirements apply to welding mercury?
296-307-48005	What general requirements apply to storing compressed gas cylinders?		Part W
296-307-48007	How must fuel-gas cylinders be stored?	296-307-520	Powered Industrial Trucks (Forklifts)
296-307-48009	How must oxygen cylinders be stored?	296-307-52001	Powered industrial trucks (forklifts).
296-307-48011	What general operating procedures apply to working with cylinders and containers?	296-307-52003	What does this section cover?
296-307-48013	What requirements apply to safety devices on cylinders?	296-307-52005	What is a "powered industrial truck"?
296-307-48015	How must cylinders be transported?	296-307-52007	What manufacturers requirements apply to powered industrial trucks?
296-307-48017	How must cylinders be handled?		What are the classifications of powered industrial trucks?

- 296-307-52009 What must a user consider before choosing a powered industrial truck?
 - 296-307-52011 What requirements determine which trucks to use in specific hazardous environments?
 - 296-307-52013 In what environments may converted trucks be used?
 - 296-307-52015 What requirements apply to overhead safety guards?
 - 296-307-52017 What requirements apply to load backrests?
 - 296-307-52019 What requirements apply to fuel handling and storage?
 - 296-307-52021 What requirements apply to lighting for operating areas?
 - 296-307-52023 What level of carbon monoxide gas is allowed?
 - 296-307-52025 What requirements apply to dockboards (bridge plates)?
 - 296-307-52027 What rules apply to loading trucks, trailers, and railroad cars with powered industrial trucks?
 - 296-307-52029 Who may operate powered industrial trucks?
 - 296-307-52031 What requirements apply to operating powered industrial trucks?
 - 296-307-52033 When may trucks be used to open or close freight car doors?
 - 296-307-52035 What requirements apply to lifting employees on the forks of trucks?
 - 296-307-52037 What requirements apply to using platforms for hoisting employees?
 - 296-307-52039 What requirements apply to traveling in a powered industrial truck?
 - 296-307-52041 What requirements apply to traveling speeds of powered industrial trucks?
 - 296-307-52043 What requirements apply to loading powered industrial trucks?
 - 296-307-52045 What requirements apply to servicing powered industrial trucks?
 - 296-307-52047 What requirements apply to maintaining powered industrial trucks?
- Part X
Rim Wheel Servicing
- 296-307-530 Rim wheel servicing.
 - 296-307-53001 What does this section cover?
 - 296-307-53003 What definitions apply to rim wheel servicing?
 - 296-307-53005 What training must an employer provide for employees who service rim wheels?
 - 296-307-53007 What requirements apply to restraining devices?
 - 296-307-53009 What other equipment must an employer provide for rim wheel servicing?
 - 296-307-53011 What requirements apply to wheel component assembly?
 - 296-307-53013 What are the safe operating procedures for servicing multipiece rim wheels?
 - 296-307-53015 What are the safe operating procedures for servicing single-piece rim wheels?
 - 296-307-53017 How can an employer order the OSHA charts?

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 296-307-28008 What training must an employer provide for employees who use agricultural equipment? [Recodified as § 296-307-28008. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28008, filed 10/31/96, effective 12/1/96.] Repealed by 98-24-096, filed 12/1/98, effective 3/1/99. Statutory Authority: RCW 49.17.040.
- 296-307-28010 What requirements apply to machine controls? [Recodified as § 296-307-28010. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28010, filed 10/31/96, effective 12/1/96.] Repealed by 98-24-096, filed 12/1/98, effective 3/1/99. Statutory Authority: RCW 49.17.040.
- 296-307-28012 What requirements apply to guarding steam pipes? [Recodified as § 296-307-28012. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28012, filed 10/31/96, effective 12/1/96.] Repealed by 98-24-096, filed 12/1/98, effective 3/1/99. Statutory Authority: RCW 49.17.040.

FIELD OPERATIONS AND GENERAL REQUIREMENTS

**Part A
General and Educational Requirements**

WAC 296-307-003 How is this chapter divided? The first three digits of the WAC (296) are the title. The second three digits are the chapter (307). The third number group is the section, which may have three or five digits. The fourth and fifth digits are treated as if there were a decimal point after the third digit.

For example: Section 330 of this chapter includes all five-digit sections whose number begins with 330.

Sections may be further divided as indicated below.

Title-Chapter-Section	296-307-330
	296-307-33003
Subsection	(1)
	(2)
Subdivision	(a)
	(b)
Item	(i)
	(ii)

Note: The chapter is also divided into "parts" according to subject, to make it easier for you to find the information you need.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-003, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-006 What does this chapter cover? (1) Chapter 296-307 WAC applies to all agricultural operations with one or more employees covered by the Washington Industrial Safety and Health Act (WISHA), chapter 49.17 RCW.

"Agricultural operations" means farming and ranching, including, but not limited to:

- (a) Cultivating and tilling the soil;
- (b) Dairy farming;
- (c) Producing, cultivating, growing, and harvesting of any agricultural or horticultural commodity;
- (d) Raising livestock, bees, fur-bearing animals, or poultry; and

(e) Any practices performed by a farmer or on a farm, incident to or in connection with such farming operations, including but not limited to preparation for market and delivery to:

- (i) Storage;
- (ii) Market; or
- (iii) Carriers for transportation to market. Agricultural operations include, but are not limited to, all employers in one or more of the following standard industrial classification (SIC) codes:

- 0111 Wheat
- 0115 Corn
- 0119 Cash grains not elsewhere classified, barley, peas, lentils, oats, etc.
- 0133 Sugar cane and sugar beets

- 0134 Irish potatoes—all potatoes except yams
- 0139 Field crops—hay, hops, mint, etc.
- 0161 Vegetables and melons, all inclusive
- 0171 All berry crops
- 0172 Grapes
- 0173 Tree nuts
- 0175 Deciduous tree fruits
- 0179 Tree fruits or tree nuts not elsewhere classified
- 0181 Ornamental floriculture and nursery products
- 0182 Food crops grown under cover
- 0191 General farms, primarily crops
- 0211 Beef cattle feedlots
- 0212 Beef cattle except feedlots—cattle ranches
- 0213 Hogs
- 0214 Sheep and goats
- 0219 General livestock except dairy and poultry
- 0241 Dairy farms
- 0251 Broiler, fryer, and roaster chickens
- 0252 Chicken eggs
- 0253 Turkeys and turkey eggs
- 0254 Poultry hatcheries
- 0259 Poultry and eggs not elsewhere classified
- 0271 Fur bearing animals and rabbits
- 0272 Horses
- 0273 Animal aquaculture
- 0279 Animal specialties not elsewhere classified
- 0291 General farms, primarily livestock and animal specialties
- 0711 Soil preparation services
- 0721 Crop planting, cultivating, and protecting
- 0722 Crop harvesting, primarily by machine
- 0751 Livestock services, except veterinary
- 0761 Farm labor contractors
- 0811 Timber tracts, Christmas tree growing, tree farms
- 0831 Forest nurseries
- 0851 Forestry services—reforestation

"Agricultural operations" do not include a farmer's processing for sale or handling for sale a commodity or product grown or produced by a person other than the farmer or the farmer's employees.

(2) Chapter 296-24 WAC does not apply to agricultural operations.

(3) All agricultural operations are also covered by the requirements of chapter 296-62 WAC, general occupational health rules.

(4) Occasionally, employees engaged in agricultural operations may also be covered by the safety standards of other industries. Following are excerpts from four industry standards that may help you determine if these other standards also apply:

Chapter 296-54 WAC Safety standards—Logging operations

WAC 296-54-501 Scope and application.

This standard establishes safety practices, means, methods and operations for all types of logging, regardless of the end use of the wood. These types of activities include, but are not limited to, pulpwood and timber harvesting and the logging of sawlogs, veneer bolts, poles, pilings and other forest products. The requirements herein contained do not apply to log handling at sawmills, plywood mills, pulp mills or other

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manufacturing operations governed by their own specific safety standards.

Chapter 296-99 WAC Safety standards for grain handling facilities

WAC 296-99-015 What grain-handling operations does this chapter cover?

(1) WAC 296-99-010 through 296-99-070 apply to:

- Dry grinding operations of soycake;
- Dry corn mills;
- Dust pelletizing plants;
- Feed mills;
- Flour mills;
- Flat storage structures;
- Grain elevators;
- Rice mills; and
- Soybean flaking operations.

(2) WAC 296-99-075, 296-99-080, and 296-99-085 apply only to grain elevators.

(3) Chapter 296-99 WAC does not apply to alfalfa storage or processing operations if they do not use grain products.

Chapter 296-78 WAC Safety standards for sawmills and woodworking operations

WAC 296-78-500 Foreword.

The chapter 296-78 WAC shall apply to and include safety requirements for all installations where the primary manufacturing of wood building products takes place. The installations may be a permanent fixed establishment or a portable operation. These operations shall include but are not limited to log and lumber handling, sawing, trimming and planing, plywood or veneer manufacturing, canting operations, waste or residual handling, operation of dry kilns, finishing, shipping, storage, yard and yard equipment, and for power tools and affiliated equipment used in connection with such operation. WAC 296-78-450 shall apply to shake and shingle manufacturing. The provisions of WAC 296-78-500 through 296-78-84011 are also applicable in shake and shingle manufacturing except in instances of conflict with the requirements of WAC 296-78-705.

Chapter 296-155 WAC Safety standards for construction work

WAC 296-155-005 Purpose and scope.

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

(5) If rules in this chapter conflict with rules in another chapter of Title 296 WAC, this chapter prevails.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-006, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-006. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.1050 and [49.17.1060. 96-22-048, § 296-306A-006, filed 10/31/96, effective 12/1/96.]

WAC 296-307-009 What definitions apply to this chapter? "Approved" means approved by the director of the

department of labor and industries, or by another organization designated by the department. Also means listed or approved by a nationally recognized testing laboratory.

"Authorized person" means someone you have approved to perform specific duties or to be at a specific location on the job site.

"Department" means the department of labor and industries. When this chapter refers to "we" or "us," it means labor and industries staff responsible for enforcing the Washington Industrial Safety and Health Act (WISHA).

"Director" means the director of the department of labor and industries, or a designated representative.

"Employee" means someone providing personal labor in the business of the employer, including anyone providing personal labor under an independent contract.

"Employer" means a business entity having one or more employees. Also, any person, partnership, or business entity with no employees but having industrial insurance coverage is both an employer and an employee. When this chapter refers to "you," it means the employer or a designated representative.

"Hazard" means a condition that can cause injury, death, or occupational disease.

"Listed" means listed by a nationally recognized testing laboratory.

"Must" means mandatory.

"Nationally recognized testing laboratory" See 29 CFR 1910.7 (federal OSHA requirements).

"Pesticide" means:

- Any substance intended to prevent, destroy, control, repel, or mitigate any insect, rodent, snail, slug, fungus, weed, and any other form of plant or animal life or virus, except virus on or in a living person or other animal which is normally considered to be a pest or which the director may declare to be a pest;

- Any substance or mixture of substances intended to be used as a plant regulator, defoliant or desiccant; and

- Any spray adjuvant, such as a wetting agent, spreading agent, deposit builder, adhesive, emulsifying agent, deflocculating agent, water modifier, or similar agent with or without toxic properties of its own, intended to be used with any pesticide as an aid to its application or effect, and sold in a package or container separate from that of the pesticide with which it is to be used.

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

"Should" or "may" means recommended.

"Standard safeguard" means a device designed and constructed to remove a hazard related to the machine, appliance, tool, building, or equipment to which it is attached.

"Working day," for appeals and accident reporting, means a calendar day, except Saturdays, Sundays, and legal holidays as defined by RCW 1.16.050. To compute the time within which an act is to be completed, exclude the first working day and include the last.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-009, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-009, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-012 What does it mean when equipment is approved by a nonstate organization? Whenever the department requires that you have equipment or processes approved by an organization such as the Underwriters Laboratories (UL), the Bureau of Mines (MSHA), or the National Institute for Occupational Safety and Health (NIOSH), the approval of that organization is considered evidence of your compliance.

[Recodified as § 296-307-012, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-012, filed 10/31/96, effective 12/1/96.]

WAC 296-307-015 What must an employer do if a serious injury occurs? (1) You must report to us within eight hours of an incident that:

- Causes a fatal or possibly fatal injury;
- Involves acute injury or illness from exposure to pesticides; or
- Causes injury requiring in-patient hospitalization of any employee.

To report, you must contact your nearest labor and industries office by phone or in person, or call the OSHA toll-free hotline, 1-800-321-6742.

EXCEPTION: If you do not learn of a reportable incident when it happens, you must report it within eight hours of learning about the incident.

(a) Your report must include:

- Establishment name;
- Location of the incident;
- Time of the incident;
- Number of fatalities, hospitalized employees, or pesticide exposures;
- Contact person;
- Phone number; and
- Brief description of the incident.

(b) Fatalities or hospitalizations that occur within thirty days of an incident must also be reported.

(2) If a department investigator asks for assistance, you must assign the employees that the investigator requests.

(3) Do not move any equipment involved in the incident until we complete an investigation.

EXCEPTION: You may move equipment to prevent additional incidents, or to remove the victim.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-015, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-015, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-018 What are the employer's responsibilities? You must:

- (1) Provide a safe and healthful working environment.
- (2) Ensure that employees do not use defective or unsafe tools and equipment, including tools and equipment that may be furnished by the employee.
- (3) Implement a written accident prevention program as required by these standards.
- (4) Implement a hazard communication program as required by chapter 296-62 WAC, Part C.
- (5) Establish a system for reporting and recording accidents on the OSHA 200 log. (See chapter 296-27 WAC.)

(6) Provide safety education and training programs.

(7) Implement the requirements of WAC 296-62-074 through 296-62-07451 to ensure the safety of employees who are exposed to cadmium in the workplace.

(8) Implement the requirements of WAC 296-62-145 through 296-62-14529 to ensure the safety of employees who are exposed to confined spaces in the workplace.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-018, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-018, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-018, filed 10/31/96, effective 12/1/96.]

WAC 296-307-021 What are the employee's responsibilities? (1) Employees must cooperate with you and other employees in efforts to eliminate accidents.

(2) Employees must be informed of and observe all safe practices.

(3) Employees must notify you of unsafe conditions of equipment or workplaces.

(4) Employees must use all required safety devices and protective equipment.

(5) Employees must not willfully damage personal protective equipment.

(6) Each employee must promptly report any job-related injury or illness to his or her immediate supervisor, regardless of the degree of severity.

(7) Employees must not engage in any activity unrelated to work that may cause injury to other employees during the course of performing work assignments.

(8) Employees must attend any required training and/or orientation programs designed to increase their competency in occupational safety and health.

(9) Employees must not report to work under the influence of alcohol or controlled substances. Alcohol or controlled substances must not be brought on the worksite.

[Recodified as § 296-307-021, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-021, filed 10/31/96, effective 12/1/96.]

WAC 296-307-024 How does an employer apply for a variance? (1) If you find that it is impractical for you to comply with specific requirements of this standard, we may permit a variation from the requirements. However, you must still provide equal protection by substitute means and comply with the requirements of chapter 49.17 RCW and chapter 296-350 WAC, variances.

(2) On the variance application you must certify that you have posted a copy of the written application in a place reasonably accessible to your employees. You must also mail a copy of the application to any authorized employee representative. The notice must advise employees of their right to request us to conduct a hearing on the variance application. You must notify employees before you apply.

Note: To request a permanent or temporary variance, you may write to: Department of Labor and Industries, WISHA Services, PO Box 44648, Olympia, WA 98504-4648. We will mail you an application form and instruction sheet. We will also send a copy of chapter 296-350 WAC, Variances, if you request it.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-024, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-024, 97-09-013, filed

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4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-024, filed 10/31/96, effective 12/1/96.]

Part B Accident Prevention Program; First-aid Requirements; Safe Place Standard

WAC 296-307-030 What are the required elements of an accident prevention program? (1) You must instruct all employees in safe working practices at the beginning of employment. Your instruction must be tailored to the types of hazards to which employees are exposed.

(2) You must develop a written accident prevention program tailored to the needs of your agricultural operation and to the types of hazards involved.

(3) Your accident prevention program must contain at least the following elements:

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

(b) How to report unsafe conditions and practices.

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

(d) What to do in emergencies. See WAC 296-307-35015 for emergency action plan requirements.

(e) Identification of hazardous chemicals or materials and the instruction for their safe use.

(f) An on-the-job review of the practices necessary to perform job assignments in a safe and healthful manner.

(4) At least once a month, you must conduct a walk-around safety inspection of active job sites, the materials and equipment involved, and operating procedures. A representative chosen by employees must be invited and allowed to accompany you.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-030, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-030, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-030, filed 10/31/96, effective 12/1/96.]

WAC 296-307-033 How often must safety meetings be held? (1) Foreman-crew safety meetings must be held at least monthly or whenever there are significant changes in job assignments. These meetings must be tailored to the particular operation or activity occurring at the time.

(2) The meeting minutes must document subjects discussed and attendance.

(3) Short-term operations that last less than one month, such as harvesting, do not require foreman-crew safety meetings but only require initial safety orientation for the operations.

(4) You must maintain copies of the minutes of each foreman-crew safety meeting at the location where the majority of employees report to work each day.

(5) You must retain minutes of foreman-crew safety meetings for one year and be able to show us copies if we ask to see them.

[Recodified as § 296-307-033, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-033, filed 10/31/96, effective 12/1/96.]

[Title 296 WAC—p. 2497]

WAC 296-307-036 What items go on the safety bulletin board? (1) You must provide a bulletin board or posting area large enough to display the required safety and health poster, "Job Safety and Health Protection" (F416-081-000), and other safety education material.

(2) The bulletin board must be readily visible in a place where employees gather during some part of the work day. (For example, at the entrance to a field, a parking area, or in a farm building.)

(3) If for any reason any employee is unable to read the notices posted on the bulletin board, you must ensure that the message of the required poster explaining employee rights is communicated to the employee in terms he or she understands. This same requirement applies to variance applications, denials or grants, and to any other notice affecting the employee's rights under WISHA.

(4) Posting must be in the employees' language.

[Recodified as § 296-307-036. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-036, filed 10/31/96, effective 12/1/96.]

WAC 296-307-039 How many people at the worksite must be first-aid trained? (1) During working hours, each farm or crew must have at least one person qualified to give first-aid.

"Qualified" means that the person holds a current certificate of first-aid training from the American Red Cross or another course with equivalent content and hours.

"Current certificate" means a first-aid training certificate that has not expired.

Note: The local department of labor and industries service location has a list of first-aid courses.

(2) The above requirement is met if the farm operator or spouse holds a current first-aid certificate and is available during working hours.

(3) Exception: The above requirements do not apply to employees whose duties require them to work alone at isolated work stations. However, employees working alone must be checked at intervals by some method agreed upon by you and the employee.

[Recodified as § 296-307-039. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-039, filed 10/31/96, effective 12/1/96.]

WAC 296-307-042 Must an employer provide first-aid kits? (1) You must furnish first-aid kits as required by this section.

(2) First-aid supplies must be readily accessible and provided for employees working alone at isolated stations.

(3) First-aid kit sizes and numbers are determined by the number of employees normally dependent upon each kit as outlined in the following table:

Number of employees normally assigned to worksite	Minimum first-aid supplies required at worksite
1-15 employees	1 ten-package kit
16-30 employees	2 ten-package kits or 1 24-package kit

31-50 employees

3 ten-package kits or 1 36-package kit

Over 50 employees
(Within 1/2 mile radius of supplies)

First-aid Station or 1 36-package kit plus stretcher and 2 blankets

Note: Kits may be carried in any motor vehicle that is used near the crew. The vehicle may be considered a first-aid station when it is identified as one and when the driver is trained in first aid.

(4) First-aid kits must have at least the following items:

- 1 package 1-inch adhesive bandages (16 per package)
- 2 packages 4-inch bandage compress (1 per package)
- 1 package scissors and tweezers (1 each per package)
- 2 packages 40-inch triangular bandage (1 per package)
- 1 package antiseptic soap or pads (3 per package)
- 2 packages eye dressing (1 per package)
- 1 package 24" x 72" absorbent gauze (1 per package)

Note: You may add items to first-aid kits.

(5) Items used from first-aid kits must be replaced before the next shift. Kits must be checked at least weekly for unauthorized removal of items.

[Recodified as § 296-307-042. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-042, filed 10/31/96, effective 12/1/96.]

WAC 296-307-045 What are the requirements of the safe place standard? (1) You must furnish to each employee a place of employment free from recognized controllable hazards likely to cause serious injury or death.

(2) You must furnish and require employees to use any safety devices and safeguards that are needed to control recognized hazards. All agricultural methods, operations, and processes must be designed to promote the safety and health of employees.

(3) You must not require an employee to engage in any duty or enter any place that is not safe.

(4) The following are prohibited:

(a) Removing, displacing, damaging, destroying or carrying off any safety device, safeguard, notice or warning intended for use in any place of employment.

(b) Interfering in any way with the use of any safety device, method or process adopted for the protection of any employee.

(5) Intoxicating beverages or narcotics in or around worksites. Employees under the influence of alcohol or narcotics are prohibited from the worksite.

Exception: This rule does not apply to anyone taking prescription drugs and/or narcotics as directed by a physician providing such use does not endanger the employee or others.

[Recodified as § 296-307-045. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-045, filed 10/31/96, effective 12/1/96.]

**Part C
Hand Tools**

WAC 296-307-050 What requirements apply to hand tools? (1) Using hoes with handles less than four feet long or any hand tool used for weeding or thinning crops in a stooped position, is prohibited.

(2) You must ensure that hand tools are in good condition. Using defective hand tools is prohibited.

(3) You must ensure that hand tools are stored safely when not in use.

[Recodified as § 296-307-050. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-050, filed 10/31/96, effective 12/1/96.]

Part D Ladders, Bulk Storage, Pits, and Trenches

WAC 296-307-055 Ladders.

[Recodified as § 296-307-055. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-055, filed 10/31/96, effective 12/1/96.]

WAC 296-307-05501 How must ladders be cared for and maintained? (1) Ladders must be checked for defects before use, and thoroughly inspected periodically. Ladders shall be inspected immediately in the following situations:

(a) If a ladder tips over, inspect for side rails dents or bends, or excessively dented rungs; check all rung-to-side-rail connections; check hardware connections; check rivets for shear.

(b) If a ladder is exposed to excessive heat, inspect visually for damage and test for deflection and strength characteristics. If you are unsure about the ladder's condition, seek help from the manufacturer.

(2) Ladders must be maintained in good condition at all times. Joints between steps and side rails must be tight. All hardware and fittings must be securely attached, and the moveable parts must operate freely without binding or with too much play.

(3) Defective ladders must be withdrawn from service for repair or destruction and tagged as "Dangerous—Do not use."

(4) Ladders with broken or missing steps, rungs, or cleats, broken side rails, or other faulty equipment must not be used; improvised repairs must not be made.

(5) Ladders must be handled with care. Avoid unnecessary dropping, jarring, or misuse.

(6) Ladder storage must:

(a) Protect the ladder when not in use;

(b) Provide sufficient support to prevent excessive sagging;

(c) Provide ease of access or inspection; and

(d) Prevent danger of accidents when withdrawing a ladder for use.

[Recodified as § 296-307-05501. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-05501, filed 10/31/96, effective 12/1/96.]

WAC 296-307-05503 How must an employer instruct employees to use ladders? (1) At the beginning of employment, you must provide employees with orientation and training on the proper use of ladders, including how to set a ladder and properly dismount with a full load.

(2) To prevent ladder upset, you must instruct employees to avoid overreaching while standing on the ladder.

(3) You must instruct employees that before climbing ladders; rungs, shoes, and boots must be clean of substances that would make them hazardous.

(4) Employees must not climb up or down ladders while carrying tools or materials that interfere with the free use of both hands.

(5) Ladders must not be placed on boxes, barrels, or other unstable bases to obtain additional height.

(6) Stepladders must not be used as single ladders.

(7) When working from a ladder over twenty-five feet from the ground or floor, the ladder must be secured at both top and bottom. When work on a ladder over twenty-five feet from the ground or floor requires the use of both hands, a safety belt must be worn and the safety lanyard secured to the ladder.

(8) Portable ladders must be placed so that the side rails have a secure footing. The top rest for portable rung and cleat ladders must be reasonably rigid and strong enough to support the applied load. The top of the ladder must be placed with the two rails supported, unless equipped with a single support attachment. Such an attachment should be substantial and large enough to support the ladder under load.

(9) Ladders carried on vehicles should be adequately supported to avoid sagging and securely fastened in position to minimize chafing and the effects of road shocks.

[Recodified as § 296-307-05503. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-05503, filed 10/31/96, effective 12/1/96.]

WAC 296-307-05505 How must orchard ladders be used? (1) Orchard ladders longer than sixteen feet are prohibited.

(2) Employers must instruct employees to not stand on the top two steps (the top cap and the next step down) of orchard ladders.

(3) Employers must instruct employees to not step off the ladder onto branches of trees except onto the main crotch.

(4) Standing on the top two steps of the orchard ladder is prohibited.

[Recodified as § 296-307-05505. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-05505, filed 10/31/96, effective 12/1/96.]

WAC 296-307-05507 What other requirements apply to ladders? (1) Ladders made by fastening cleats across a single rail are prohibited.

(2) Wood ladders, when not in use, should be stored where they will not be exposed to the elements, but where there is good ventilation. They must be stored away from radiators, stoves, steam pipes, or other excessive heat or dampness.

(3) Wooden ladders should be kept coated with a suitable protective material. Painted ladders are acceptable if the ladders are carefully inspected prior to painting by competent and experienced inspectors acting for, and responsible to, the purchaser, and if the ladders are not for resale.

(4) A ladder must have feet that are appropriate for the surface on which it will be used.

For example: A ladder used on a slippery surface must have steel points or other nonslip material on its feet.

(5) Ladders must not be placed in front of doors opening toward the ladder unless the door is blocked open, locked, or guarded.

(6) Ladder safety devices may be used on tower, water tank and chimney ladders over twenty feet long in place of cage protection. No landing platform is required in these cases. All ladder safety devices such as lifebelts, friction brakes, and sliding attachments must meet the design requirements of the ladders that they serve.

(7) See chapter 296-307 WAC Part K for requirements related to working near overhead lines.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-05507, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-05507, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-05507, filed 10/31/96, effective 12/1/96.]

WAC 296-307-060 What requirements apply to job-made ladders? A "job-made ladder" is a ladder that you or your employees build.

Job-made ladders must meet the following requirements:

(1) All cleats must be made of one-by-four-inch nominal lumber, or stronger.

(2) Cleats must be inset into the edges of side rails to a depth of one-half inch, or filler blocks must be used on the rails between the cleats.

(3) Each cleat must be fastened to each rail with three 8d common wire nails or other fasteners of equal strength.

(4) Cleats must be uniformly spaced approximately 12 inches from the top of one cleat to the top of the next.

(5) Side rails must be continuous, unless splices develop the full strength of a continuous rail of equal length.

[Recodified as § 296-307-060, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-060, filed 10/31/96, effective 12/1/96.]

WAC 296-307-061 What requirements apply to working around bins, bunkers, hoppers, tanks, pits, and trenches? (1) Employees must be prohibited from entering any bin, bunker, hopper, or similar area when loose materials (such as chips, sand, grain, gravel, sawdust, etc.) may collapse, unless the employee wears a safety belt with a lifeline attached and is attended by a helper.

Note: Silage pits are exempt from this section.

(2) When employees are required to work in a trench or a pit 4 feet deep or more, the trench or the pit must be shored or sloped according to the following table:

SOIL OR ROCK TYPE MAXIMUM ALLOWABLE	SLOPES (H:V) (1) FOR EXCAVATIONS LESS THAN 20 FEET DEEP (2)
STABLE ROCK	VERTICAL (90°)
TYPE A	3/4:1 (53°)
TYPE B	1:1 (45°)
TYPE C	1 1/2:1 (34°)

- 1 Numbers in parentheses next to maximum allowable slopes are angles in degrees from the horizontal. Angles have been rounded off.
- 2 Sloping or benching for excavations greater than 20 feet deep must be designed by a registered professional engineer.

(3) Each soil and rock deposit must be classified by a competent person as Stable Rock, Type A, B, or C according to the definitions in WAC 296-155-66401. "Competent person" means someone who is able to identify working conditions that are hazardous to employees, and has authority to take prompt action to eliminate the hazards.

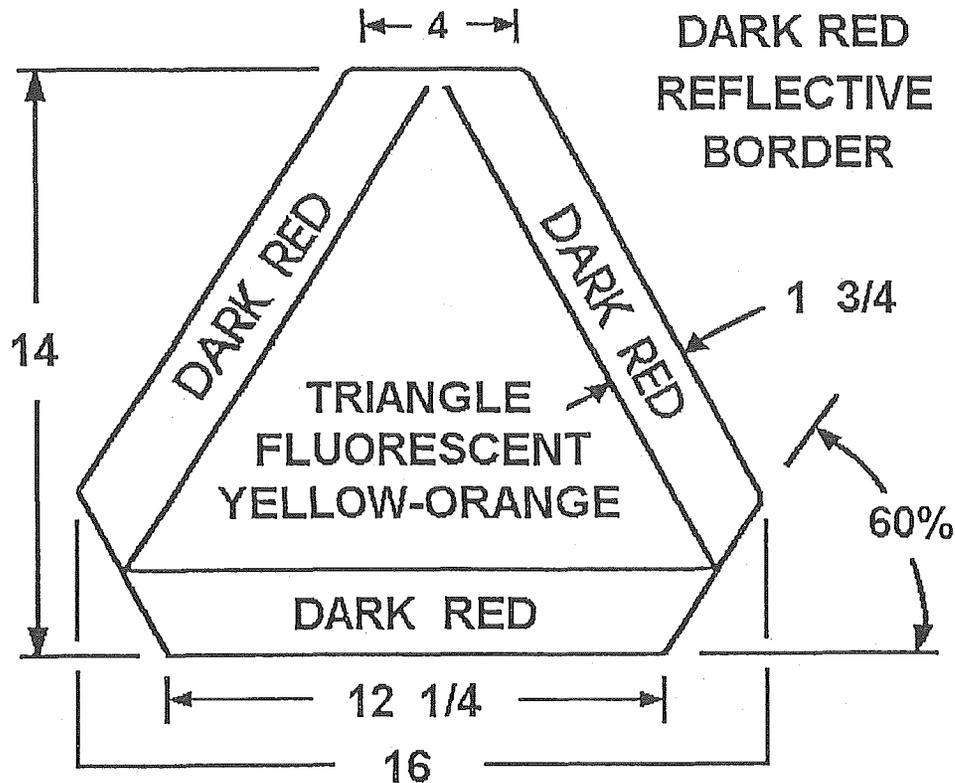
(4) Classification of the deposits must be based on the results of at least one visual and at least one manual analysis. The analyses must be conducted by a competent person using tests in recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture textural classification system.

[Recodified as § 296-307-061, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-061, filed 10/31/96, effective 12/1/96.]

**Part E
Vehicles and Farm Field Equipment**

WAC 296-307-065 How must slow-moving vehicles be marked? (1) You must ensure that all farm tractors and other slow-moving farm vehicles and equipment used on public roads have lamps, reflectors, and a slow-moving vehicle emblem. From one-half hour after sunset to one-half hour before sunrise, slow-moving vehicles must have lights and reflectors.

(2) The slow-moving vehicle emblem is a fluorescent yellow-orange triangle with a dark red reflective border. (See figure.) The emblem must be used on public roads only by vehicles designed to move slowly (25 M.P.H. or less).



[Recodified as § 296-307-065. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-065, filed 10/31/96, effective 12/1/96.]

WAC 296-307-070 Motor vehicles.

[Recodified as § 296-307-070. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-070, filed 10/31/96, effective 12/1/96.]

WAC 296-307-07001 How must motor vehicles be maintained? (1) You must maintain all motor vehicles and their parts in good repair and safe condition.

(2) You must not use tires that are worn beyond the point of safety.

(3) Employees must report to you any motor vehicle or other farm equipment that is in unsafe operating condition. You must ensure that the vehicle or equipment is removed from service and repaired before use.

(4) Before an employee performs service or repair work under hydraulic or mechanical raised dump truck beds, blades, discs, or other equipment, the raised portion of the equipment must be manually pinned or blocked to prevent falling.

[Recodified as § 296-307-07001. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-07001, filed 10/31/96, effective 12/1/96.]

WAC 296-307-07003 How must motor vehicles be operated? (1) Vehicles must be driven at safe operating speed.

(2) Truck drivers must operate equipment at a safe speed for roadway conditions.

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(3) When an employee backing a truck has obstructed vision, the employee must be assisted by a signaler. The signaler must have a clear view of the rear of the truck and the operator of the truck.

(4) Truck drivers must sound their horn before starting to back, and intermittently while backing.

(5) Shut off motors before refueling. Take care to prevent fuel from spilling on hot parts.

[Recodified as § 296-307-07003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-07003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-07005 Who may operate motor vehicles? Only qualified drivers may operate motor vehicles and must have a current motor vehicle operator's license.

[Recodified as § 296-307-07005. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-07005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-07007 What requirements apply to motor vehicle brakes? (1) You must ensure that motor vehicles have brakes that will safely hold the maximum load on maximum grades.

(2) Trucks parked on an incline must have the steered wheels turned into the curb and must have at least one "driver" wheel chocked on each side, independent of the braking system.

Exception: If the truck has a functioning secondary braking system, the turned wheels and chock are not required.

(3) You must ensure that trailers have working air brakes, or another approved type. Air must be cut into the trailer brake system at the time that the trailer is coupled to the truck.

(4) The driver must test truck and trailer brakes before driving down a steep grade.

[Recodified as § 296-307-07007. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-07007, filed 10/31/96, effective 12/1/96.]

WAC 296-307-07009 How must motor vehicles be loaded and unloaded? (1) You must ensure that employees load and unload motor vehicles safely.

(2) All loads transported on trucks or truck and trailer combinations must be properly secured and distributed. Loads must not exceed the safe operating load for the roadway condition and the capacity of the bridges, trestles, and other structures.

[Recodified as § 296-307-07009. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-07009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-07011 What safety equipment must motor vehicles have? All motor vehicles must have standard lights, horn, flags, flares, and other safety equipment that conforms to the state of Washington motor vehicles laws.

[Recodified as § 296-307-07011. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-07011, filed 10/31/96, effective 12/1/96.]

WAC 296-307-07013 What rules apply to vehicles used to transport employees? You must ensure that motor vehicles used regularly to transport employees meet the following requirements:

(1) The vehicles are well equipped, covered against the weather, and maintained in good mechanical condition at all times.

(2) A sufficient number of properly secured seats are provided in each vehicle to accommodate the number of employees transported. When emergency conditions make it necessary to transport more employees than the seating capacity can accommodate, all employees must ride within the vehicle. No employee may ride on fenders or running boards of the vehicle.

(3) No employees may ride in or on any vehicle with their legs hanging over the end or sides. All trucks without tail gates should have safety bars.

(4) The vehicles have storage strong enough to retain sharp tools that could present a hazard to employees being transported.

(5) All dump-trucks used to transport employees have an adequate safety chain or locking device to ensure that the body of the truck is not raised while employees are riding in it.

(6) Explosives or highly inflammable materials are not carried in or on the vehicle while it is used to transport employees.

(7) Exhaust systems are installed and maintained in proper condition, and are designed to eliminate the employee exposure to exhaust gases and fumes.

(8) Within the cab, crew trucks must carry only the number of passengers for which they are designed. In any seating arrangement, the driver must be able to maintain full freedom of motion. The driver's normal vision must be free from obstruction by passengers or the seating arrangement.

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(9) All enclosed crew trucks have an emergency exit in addition to the regular entrance.

(10) Trucks used for hauling gravel may be used as crew trucks if they meet the following requirements:

(a) Steps in proper places;

(b) Wooden floors;

(c) Securely fastened seats;

(d) Truck is properly covered; and

(e) Compliance with all other general regulations covering crew trucks.

(11) Half-ton vehicles must haul no more than six persons including driver. Three-quarter-ton vehicles must haul no more than eight persons including driver.

(12) The vehicle is equipped with the first-aid supplies required by WAC 296-307-042, two blankets, and a fire extinguisher.

(13) Heating units with open fires are not used in vehicles transporting crews.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-07013, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-07013. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-07013, filed 10/31/96, effective 12/1/96.]

WAC 296-307-073 What requirements apply to changing and charging storage batteries? (1) Battery changing installations must be located in areas designated for that purpose.

(2) Facilities must be provided for:

• Flushing and neutralizing spilled electrolyte;

• Fire protection;

• Protecting charging apparatus from damage by trucks;

and

• Adequate ventilation of fumes from gassing batteries.

(3) Racks used to support batteries should be made of or covered with materials that will not create sparks.

(4) A conveyor, overhead hoist, or equivalent material handling equipment must be provided for handling batteries.

(5) Reinstalled batteries must be properly positioned and secured in the vehicle.

(6) A carboy tilter or siphon must be provided for handling electrolyte.

(7) When mixing water and acid for charging batteries, pour acid into water; do not pour water into acid.

(8) Vehicles must be properly positioned and the brake applied before attempting to change or charge batteries.

(9) When charging batteries, the vent caps should be kept in place to avoid electrolyte spray. You must ensure that vent caps function. The battery (or compartment) cover(s) must be open for cooling.

(10) Precautions shall be taken to prevent open flames, sparks, or electric arcs in battery charging areas.

(11) Tools and other metallic objects must be kept away from the tops of uncovered batteries.

[Recodified as § 296-307-073. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-073, filed 10/31/96, effective 12/1/96.]

WAC 296-307-076 How must farm field equipment be guarded? "Farm field equipment" means tractors or

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implements, including self-propelled implements, used in agricultural operations.

(1) All power transmission components must be guarded according to WAC 296-307-280.

(2) The manufacturer's instruction manual, if published by the manufacturer and currently available, must be the source of information for the safe operation and maintenance of field equipment.

(3) You must ensure that all power takeoff shafts, including rear, mid-mounted or side-mounted shafts, are guarded by a master shield, as follows:

(a) The rear power takeoff has a master shield. The master shield is strong enough to prevent permanent deformation of the shield when a 250-pound operator mounts or dismounts the tractor using the shield as a step.

(b) Power takeoff driven equipment is guarded to prevent employee contact with rotating members of the power drive system. When the tractor master shield must be removed to use specific power takeoff driven equipment, the equipment must provide protection from the part of the tractor power takeoff shaft that protrudes from the tractor.

(c) Signs are placed at prominent locations on the tractor and on power takeoff driven equipment requiring that safety shields are kept in place.

(4) The following functional components must be shielded to a degree consistent with the intended function and operator's vision of the component.

- Snapping or husking rolls;
- Straw spreaders and choppers;
- Cutterbars;
- Flail rotors;
- Rotary beaters;
- Mixing augers;
- Feed rolls;
- Conveying augers;
- Rotary tillers; and
- Similar units that must be exposed for proper function

(5) Where removing a guard or access door will expose an employee to any component that continues to rotate after the power is disengaged, you must provide, in the immediate area:

(a) A safety sign warning the employee to look and listen for evidence of rotation and to wait until all components have stopped before removing the guard or access door.

(b) A readily visible or audible warning of rotation on equipment manufactured after October 25, 1976.

(6) If the mounting steps or ladder and the handholds of the propelling vehicle are made inaccessible by installation of other equipment, other steps and handholds must be provided on the equipment.

(7) You must ensure that the operator's steps and platform have a slip-resistant covering to minimize the possibility of slipping.

(8) Powered machines not driven by an individual motor must have a clutch or other effective means of stopping.

(9) All friction clutches must have sufficient clearance and be kept adjusted to prevent drag or creeping when disengaged.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-076, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-076. 97-09-013, filed (1999 Ed.)

4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-076, filed 10/31/96, effective 12/1/96.]

Part F

Rollover Protective Structures (ROPS) for Tractors

WAC 296-307-080 Rollover protective structures (ROPS) for tractors.

[Recodified as § 296-307-080. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-080, filed 10/31/96, effective 12/1/96.]

WAC 296-307-08003 Which agricultural tractors are covered by this section? All agricultural tractors manufactured after October 25, 1976, must meet the requirements of WAC 296-307-080. An agricultural tractor manufactured on or before October 25, 1976, must meet the requirements of WAC 296-307-080 if:

(1) The tractor was built or sold with rollover protective structures (ROPS) as an optional accessory; or

(2) According to the manufacturer, the tractor was designed to accommodate the addition of ROPS.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-08003, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-08003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-08003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-08006 What definitions apply to rollover protective structures (ROPS) for agricultural tractors? "Agricultural tractor" means a two-wheel-drive or four-wheel-drive vehicle, or a track vehicle of more than twenty net engine horsepower, designed to furnish the power to pull, carry, propel, or drive implements that are designed for agriculture. All human-powered implements are excluded.

"Low profile tractor" means a wheel or track-equipped vehicle with the following characteristics:

- The front wheel spacing is equal to the rear wheel spacing, as measured between the centerlines of the wheels;

- The clearance from the bottom of the tractor chassis to the ground is eighteen inches or less;

- The highest point of the hood is sixty inches or less, and

- The tractor is designed so that the operator straddles the transmission when seated.

[Recodified as § 296-307-08006. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-08006, filed 10/31/96, effective 12/1/96.]

WAC 296-307-08009 What requirements apply to the testing and performance of ROPS used on agricultural tractors? You must provide a rollover protective structure (ROPS) for each employee-operated tractor that is covered by WAC 296-307-080. ROPS used on wheel-type tractors must meet the test and performance requirements of OSHA 1928.52 CFR, Protective Frames for Wheel Type Agricultural Tractors, and ROPS used on track-type tractors must meet the test and performance requirements of SAE Standard J334a (July 1970) and the portions of SAE Standard J167 (1971) pertaining to overhead protection requirements.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-08009, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-08009. 97-09-013, filed

4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-08009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-08012 What requirements apply to seatbelts used with ROPS on agricultural tractors? (1) Where ROPS are required by WAC 296-307-080, you must:

- (a) Provide each tractor with a seatbelt;
 - (b) Require that each employee use the seatbelt while the tractor is moving; and
 - (c) Require that each employee tighten the seatbelt sufficiently to confine the employee to the ROPS protected area.
- (2) Each seatbelt and seatbelt anchorage must meet the requirements of ANSI/SAE J800 April 1986, Motor Vehicle Seat Belt Assemblies.

(a) Where a suspended seat is used, the seatbelt must be fastened to the movable portion of the seat.

(b) The seatbelt webbing material must be at least as resistant to acids, alkalis, mildew, aging, moisture and sunlight as untreated polyester fiber.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-08012, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-08012. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-08012, filed 10/31/96, effective 12/1/96.]

WAC 296-307-08015 When are ROPS not required on agricultural tractors? ROPS are not required on agricultural tractors that are used as follows:

(1) Low profile tractors used in orchards, vineyards or hop yards where the vertical clearance requirements would substantially interfere with normal operations, and for work related to these uses.

(2) Low profile tractors while used inside a farm building or greenhouse in which the vertical clearance is insufficient to allow a ROPS equipped tractor to operate.

(3) Tractors while used with mounted equipment that is incompatible with ROPS (for example, cornpickers, cotton strippers, vegetable pickers, and fruit harvesters).

(4) Track-type agricultural tractors whose overall width (measured between the outside edges of the tracks) is at least three times the height of the rated center of gravity, and whose rated maximum speed in forward or reverse is not greater than seven miles per hour, when used only for tillage or harvesting operations, and which:

(a) Does not involve operating on slopes in excess of forty percent from horizontal; and

(b) Does not involve operating on piled crop products or residue (for example: Silage in stacks or pits); and

(c) Does not involve operating in close proximity to irrigation ditches, streams or other excavations more than two feet deep that contain slopes of more than forty percent from horizontal; and

(d) Does not involve construction-type operation, such as bulldozing, grading, or land clearing.

[Recodified as § 296-307-08015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-08015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-08018 What employee training requirements apply to ROPS used on agricultural tractors? (1) You must ensure that every employee who operates

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an agricultural tractor is informed of the operating practices listed below and of any other practices dictated by the work environment. You must provide the information at the time of initial assignment and at least annually thereafter.

EXHIBIT A

EMPLOYEE OPERATING INSTRUCTIONS

1. Securely fasten your seat belt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near ditches, embankments and holes.
3. Reduce speed when turning, crossing slopes and on rough, slick or muddy surfaces.
4. Stay off slopes too steep for safe operation.
5. Watch where you are going, especially at row ends, on roads and around trees.
6. Passengers, other than persons required for instruction or machine operation, shall not be permitted to ride on equipment unless a passenger seat or other protective device is provided.
7. Operate the tractor smoothly—no jerky turns, starts, or stops.
8. Hitch only to the drawbar and hitch points recommended by tractor manufacturers.
9. When tractor is stopped, set brakes securely and use park lock if available.

(2) You must ensure that every employee who operates an agriculture tractor is trained specifically in the operation of the tractor to be used. The training must include an orientation of the operator to the topographical features of the land where the tractor will be operated. Training must emphasize safe operating practices to avoid rollover.

(3) The tractor training program must be described in the written accident prevention program required by WAC 296-307-030.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-08018, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-08018. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 97-08-051A, § 296-306A-08018, filed 3/31/97, effective 5/1/97; 96-22-048, § 296-306A-08018, filed 10/31/96, effective 12/1/96.]

WAC 296-307-08021 What other requirements apply to ROPS used on agricultural tractors? (1) You must ensure that batteries, fuel tanks, oil reservoirs, and coolant systems are constructed and located or sealed to ensure that no spillage comes in contact with the operator in the event of an upset.

(2) All sharp edges and corners at the operator's station must be designed to minimize operator injury in the event of an upset.

(3) When ROPS are removed, they must be remounted to meet the requirements of WAC 296-307-080.

(4) You must ensure that each ROPS has a label, permanently affixed to the structure, that states:

- (a) Manufacturer's or fabricator's name and address;
- (b) ROPS model number, if any;
- (c) Tractor makes, models, or series numbers that the structure is designed to fit; and
- (d) That the ROPS model was tested in accordance with the requirements of this section.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-08021, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-08021. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050

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and [49.17.]060. 96-22-048, § 296-306A-08021, filed 10/31/96, effective 12/1/96.]

WAC 296-307-085 When must ROPS be provided for material handling equipment? (1) This section applies to the following types of material handling equipment: Rubber-tired, self-propelled scrapers; rubber-tired front-end loaders; rubber-tired dozers; wheel-type agricultural and industrial tractors; crawler tractors; crawler-type loaders; and motor graders, with or without attachments, that are used in agricultural work. This section does not apply to side-boom pipelaying tractors.

(2) You must ensure that material handling equipment manufactured on or after October 25, 1976, is equipped with ROPS that meet the minimum performance standards of WAC 296-307-08009.

(3) ROPS and supporting attachments must meet the minimum performance standards of OSHA 1928.52 CFR, Protective Frames for Wheel Type Agricultural Tractors, or must be designed, fabricated, and installed in a manner that will support, based on the ultimate strength of the metal, at least two times the weight of the prime mover applied at the point of impact.

(a) The ROPS must be designed to minimize the likelihood of a complete overturn and to minimize the possibility of the operator being crushed in a rollover.

(b) The design must provide a vertical clearance of at least fifty-two inches from the work deck to the ROPS at the entrance.

(4) When ROPS are removed, they must be remounted so as to meet the requirements of this section.

(5) Each ROPS must have a label, permanently affixed to the structure, that states:

(a) Manufacturer's or fabricator's name and address;

(b) ROPS model number, if any;

(c) Tractor makes, models, or series numbers that the structure is designed to fit; and

(d) That the ROPS model was tested in accordance with the requirements of this section.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-085, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-085. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-085, filed 10/31/96, effective 12/1/96.]

WAC 296-307-090 What requirements apply to overhead protection for operators of agricultural and industrial tractors? This section applies to wheel-type agricultural tractors used in construction work and to wheel-type industrial tractors used in agriculture work.

(1) If grid or mesh is used for overhead protection, the largest permissible opening is 1.5 in. (38 mm.) in diameter. The overhead protection must not be installed in such a way as to become a hazard in the case of upset.

(2) All equipment used in site clearing operations must have rollover guards meeting the requirements of this chapter. You must ensure that rider-operated equipment is equipped with an overhead and rear canopy guard meeting the following requirements:

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(a) The overhead covering is at least eighth-inch steel plate or quarter-inch woven wire mesh with openings no greater than one inch, or equivalent.

(b) The opening in the rear of the canopy structure is covered with not less than quarter-inch woven wire mesh with openings no greater than one inch.

(3) Overhead protection that meets the provisions of SAE Standard J334 (July 1970) for rubber-tired dozers and rubber-tired loaders also meets the requirements of this standard.

[Recodified as § 296-307-090. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-090, filed 10/31/96, effective 12/1/96.]

Part G Field Sanitation

WAC 296-307-095 Field sanitation.

[Recodified as § 296-307-095. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-095, filed 10/31/96, effective 12/1/96.]

WAC 296-307-09503 What does this section cover? WAC 296-307-095 applies to any agricultural employer with one or more employees engaged in any hand-labor operations in the field.

EXCEPTION: WAC 296-307-09515 (handwashing facilities) and 296-307-09518 (toilet facilities) do not apply if your employees:

(1) Are engaged in field activities for the production of grains, livestock, or livestock feed; or

(2) Use vehicles, machinery, or animals as part of their field activities and, when needed, can transport themselves to and from toilet and handwashing facilities.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-09503, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-09503. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-09503, filed 10/31/96, effective 12/1/96.]

WAC 296-307-09506 What definitions apply to this section? "Accessible" means a maximum of one-quarter mile or five minutes travel time from the worksite.

"Hand-labor operations" means agricultural operations performed by hand or with hand tools.

For example: The hand cultivation, weeding, planting or harvesting of vegetables, nuts, fruit, seedlings or other crops, including mushrooms, and hand packing into containers.

EXCEPTION: Hand-labor does not include logging operations, the care or feeding of livestock, or hand-labor operations in permanent structures (e.g., canning facilities or packing houses).

"Handwashing facility" means a facility that meets the requirements of WAC 296-307-09515 and is approved by the local health authority.

"Toilet" means a fixed or portable facility designed for the purpose of adequate collection and containment of both defecation and urination. "Toilet" includes biological, chemical, flush, and combustion toilets, or sanitary outhouses.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-09506, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-09506. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050

and [49.17.]060. 96-22-048, § 296-306A-09506, filed 10/31/96, effective 12/1/96.]

WAC 296-307-09509 What orientation must employers provide for field sanitation? You must provide each employee with verbal orientation on field sanitation facilities. The orientation must be understandable to each employee and must include:

(1) The location of potable water supplies and the importance of drinking water frequently, especially on hot days;

(2) Identification of all nonpotable water at the worksite and prohibition of the use of nonpotable water for sanitation purposes with an explanation of the hazards associated with using nonpotable water;

(3) The location of handwashing facilities and the importance of handwashing:

(a) Before and after using the toilet; and

(b) Before eating and smoking; and

(4) The location of toilet facilities; an explanation that facilities are for employee convenience and health considerations; the necessity to keep them sanitary; and that using the fields, orchards, or forests is not an option.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-09509, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-09509. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-09509, filed 10/31/96, effective 12/1/96.]

WAC 296-307-09512 What potable water sources must an employer provide? You must provide potable water for employees engaged in hand-labor operations in the field, without cost to the employee. Potable water must meet the following requirements:

(1) Potable water is in locations that are accessible to all employees.

(2) Potable water containers are refilled daily or more often as necessary.

(3) Potable water dispensers are designed, constructed, and serviced so that sanitary conditions are maintained. They are closeable and equipped with a tap.

(4) Open containers such as barrels, pails, or tanks for drinking water from which water must be dipped or poured, whether or not they are fitted with a cover, are prohibited.

(5) Any container used to distribute drinking water is clearly marked in English and with the appropriate international symbol describing its contents.

(6) Any container used to distribute drinking water is only used for that purpose.

(7) Potable water is suitably cool and provided in sufficient amounts, taking into account the air temperature, humidity, and the nature of the work performed, to meet employees' needs.

Note: Suitably cool water should be sixty degrees Fahrenheit or less. During hot weather, employees may require up to three gallons of water per day.

(8) The use of common drinking cups or dippers is prohibited. Water is dispensed in single-use drinking cups, personal containers, or by water fountains.

"Single-use drinking cups" means containers of any type or size, disposable or not, and including personal containers

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if the choice to use a personal container is made by the employee, not the employer.

(9) Employees must be prohibited from drinking from irrigation ditches, creeks or rivers. Potable water must meet the quality standards for drinking purposes of the state or local authority, or must meet quality standards of the United States Environmental Protection Agency's National Interim—Primary Drinking Water Regulations, published in 40 CFR Part 141 and 40 CFR 147.2400.

[Recodified as § 296-307-09512. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-09512, filed 10/31/96, effective 12/1/96.]

WAC 296-307-09515 What handwashing facilities must an employer provide? You must provide handwashing facilities for employees engaged in hand-labor operations in the field, without cost to the employee. Handwashing facilities must meet the following requirements:

(1) One handwashing facility with a tap and an adequate supply of water, soap, single-use hand towels, and either a basin or other suitable container for washing is provided for each twenty employees or fraction of twenty.

Note: Nonpotable water must not be used for washing any part of a person, except as permitted by the local health authority.

(2) Each facility has running water.

(3) Each facility has a dispenser containing handsoap or a similar cleansing agent.

(4) Each facility has individual single-use hand towels.

(5) Facilities are maintained in a clean and sanitary condition according to appropriate public health sanitation practices.

(6) Waste receptacles are provided. Disposal of wastes from the facilities does not create a hazard nor cause an unsanitary condition.

(7) Employees are allowed reasonable time during the work period to use the facilities.

(8) Handwashing facilities are near toilet facilities and within one-quarter mile of each employee's worksite in the field.

Exception: Where it is not feasible to locate facilities as required above, the facilities must be located at the point of closest vehicular access.

[Recodified as § 296-307-09515. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-09515, filed 10/31/96, effective 12/1/96.]

WAC 296-307-09518 What toilet facilities must an employer provide? You must provide toilet facilities for employees engaged in hand-labor operations in the field, without cost to the employee. Toilet facilities must meet the following requirements:

(1) One toilet facility is provided for each twenty employees or fraction of twenty.

(2) You must ensure, at the beginning of each day, that the toilets are inspected. If any toilet facility fails to meet the requirements of this section, immediate corrective action is taken. Inspections are documented and the record maintained at the worksite for at least seventy-two hours.

(3) Toilet facilities are adequately ventilated; appropriately screened, and have self-closing doors that can be closed

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and latched from the inside. Toilet facilities are constructed to ensure privacy.

(4) Facilities are maintained in a clean, sanitary, and functional condition and according to appropriate public health sanitation practices.

(5) Toilets are supplied with toilet paper.

(6) Disposal of wastes from the facilities does not create a hazard or cause an unsanitary condition.

(7) Employees are allowed reasonable time during the work period to use the facilities.

(8) Facilities are near handwashing facilities and within one-quarter mile of each employee's worksite in the field.

Exception: Where it is not feasible to locate facilities as required above, the facilities must be located at the point of closest vehicular access.

[Recodified as § 296-307-09518. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-09518, filed 10/31/96, effective 12/1/96.]

Part H Personal Protective Equipment

WAC 296-307-100 Personal protective equipment.

[Recodified as § 296-307-100. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-100, filed 10/31/96, effective 12/1/96.]

WAC 296-307-10005 Who must provide personal protective equipment? (1) You must ensure that employees are protected from injury or impairment of any bodily function that might occur through absorption, inhalation or physical contact of any substance, vapor, radiation, or physical hazard. Wherever appropriate, you must ensure that employees use protective clothing; respiratory devices; shields; barriers; and adequate protective equipment for eyes, face, head, and extremities.

(2) You must provide personal protective equipment at no cost to employees, including replacement due to normal wear and tear. The equipment must be maintained in sanitary and reliable condition.

Exception: You may require employees to provide their own normal work clothing, including long-sleeved shirts, long-legged pants, and socks.

(3) If employees provide their own protective equipment, then you must ensure that the equipment is adequate, properly maintained, and sanitary.

[Recodified as § 296-307-10005. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-10005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-10010 What requirements apply to eye protection? You must require eye protection wherever employees are exposed to flying objects, welding or cutting glare, injurious liquids, or injurious radiation. Eye protectors must meet the criteria of the American National Standard for Occupational and Educational Eye and Face Protection.

[Recodified as § 296-307-10010. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-10010, filed 10/31/96, effective 12/1/96.]

WAC 296-307-10015 How must personal protective equipment be used? (1) You must ensure that employees

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use personal protective equipment according to the manufacturer's instructions.

(2) You must ensure that, before each use, employees inspect all personal protective equipment for leaks, holes, tears, or worn places, and any damaged equipment is repaired or discarded.

(3) The employee must use personal protective equipment according to instructions and training received.

(4) The employee shall notify you of any defects in personal protective equipment or when the equipment becomes contaminated.

[Recodified as § 296-307-10015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-10015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-10020 What must an employer do to prevent heat-related illness? You must take appropriate measures to prevent heat-related illness that may be caused by employees wearing any required personal protective equipment.

[Recodified as § 296-307-10020. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-10020, filed 10/31/96, effective 12/1/96.]

WAC 296-307-10025 What instruction on personal protective equipment must an employer give to employees? You must instruct each employee in the proper use of personal protective equipment. The instruction must include any special limitations or precautions indicated by the manufacturer.

[Recodified as § 296-307-10025. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-10025, filed 10/31/96, effective 12/1/96.]

Part I Pesticides (Worker Protection Standard)

WAC 296-307-107 Federal worker protection standards—Washington state department of agriculture. This part contains the federal Environmental Protection Agency worker protection standards as listed in 40 CFR, Part 170. Revisions to the federal language have been incorporated into this chapter in order to be consistent with other requirements of Washington state law. These rules are adopted in conjunction with rules adopted by the Washington state department of agriculture in chapter 16-233 WAC.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-107, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-107. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-107, filed 9/30/96, effective 11/1/96.]

WAC 296-307-110 Scope and purpose—Worker protection standards—40 CFR, § 170.1. This part contains standards designed to reduce the risks of illness or injury resulting from workers' and handlers' occupational exposures to pesticides used in the production of agricultural plants on farms or in nurseries, greenhouses, and forests and also to reduce the accidental exposure of workers and other persons to such pesticides. It requires workplace practices designed to reduce or eliminate exposure to pesticides and establishes procedures for responding to exposure-related emergencies.

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[Recodified as § 296-307-110. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-110, filed 9/30/96, effective 11/1/96.]

WAC 296-307-11005 Definitions—Worker protection standards—40 CFR, § 170.3. Terms used in this part have the same meanings they have in the Federal Insecticide, Fungicide, and Rodenticide Act, as amended. In addition, the following terms, when used in this part, shall have the following meanings:

"Agricultural emergency" means a sudden occurrence or set of circumstances which the agricultural employer could not have anticipated and over which the agricultural employer has no control, and which requires entry into a pesticide treated area during a restricted-entry interval, when no alternative practices would prevent or mitigate a substantial economic loss.

"Agricultural employer" means any person who hires or contracts for the services of workers, for any type of compensation, to perform activities related to the production of agricultural plants, or any person who is an owner of or is responsible for the management or condition of an agricultural establishment that uses such workers.

Note: This definition does not conflict with the definition of employer in WAC 296-307-012.

"Agricultural establishment" means any farm, forest, nursery, or greenhouse.

"Agricultural plant" means any plant grown or maintained for commercial or research purposes and includes, but is not limited to, food, feed, and fiber plants; trees; turfgrass; flowers, shrubs; ornamentals; and seedlings.

"Animal premise" means the actual structure used to house, cage or confine animals such as: Barns, poultry houses, mink sheds, corrals, or structures used for shelter.

"Chemigation" means the application of pesticides through irrigation systems.

"Commercial pesticide handling establishment" means any establishment, other than an agricultural establishment, that:

- Employs any person, including a self-employed person, to apply on an agricultural establishment, pesticides used in the production of agricultural plants.

- Employs any person, including a self-employed person, to perform on an agricultural establishment, tasks as a crop advisor.

"Crop advisor" means any person who is assessing pest numbers or damage, pesticide distribution, or the status or requirements of agricultural plants and who holds a current Washington state department of agriculture commercial consultant license in the agricultural areas in which they are advising. The term does not include any person who is performing hand labor tasks.

"Early entry" means entry by a worker into a treated area on the agricultural establishment after a pesticide application is complete, but before any restricted-entry interval for the pesticide has expired.

"Farm" means any operation, other than a nursery or forest, engaged in the outdoor production of agricultural plants.

"Forest" means any operation engaged in the outdoor production of any agricultural plant to produce wood fiber or timber products.

"Fumigant" means any pesticide product that is a vapor or gas, or forms a vapor or gas on application, and whose method of pesticidal action is through the gaseous state.

"Greenhouse" means any operation engaged in the production of agricultural plants inside any structure or space that is enclosed with nonporous covering and that is of sufficient size to permit worker entry. This term includes, but is not limited to, polyhouses, mushroom houses, rhubarb houses, and similar structures. It does not include such structures as malls, atriums, conservatories, arboretums, or office buildings where agricultural plants are present primarily for aesthetic or climatic modification.

"Hand labor" means any agricultural activity performed by hand or with hand tools that causes a worker to have substantial contact with surfaces (such as plants, plant parts, or soil) that may contain pesticide residues. These activities include, but are not limited to, harvesting, detasseling, thinning, weeding, topping, planting, sucker removal, pruning, disbudding, roguing, and packing produce into containers in the field. Hand labor does not include operating, moving, or repairing irrigation or watering equipment or performing the tasks of crop advisors.

"Handler" means any person, including a self-employed person:

- Who is employed for any type of compensation by an agricultural establishment or commercial pesticide handling establishment to which WAC 296-307-130 applies and who is:

- Mixing, loading, transferring, or applying pesticides.
- Disposing of pesticides or pesticide containers.
- Handling opened containers of pesticides.
- Acting as a flagger.
- Cleaning, adjusting, handling, or repairing the parts of mixing, loading, or application equipment that may contain pesticide residues.

- Assisting with the application of pesticides.

- Entering a greenhouse or other enclosed area after the application and before the inhalation exposure level listed in the labeling has been reached or one of the ventilation criteria established by WAC 296-307-12015 (3)(c) or in the labeling has been met:

- ◆ To operate ventilation equipment.
- ◆ To adjust or remove coverings used in fumigation.
- ◆ To monitor air levels.

- Entering a treated area outdoors after application of any soil fumigant to adjust or remove soil coverings such as tarpaulins.

- Performing tasks as a crop advisor:

- ◆ During any pesticide application.
- ◆ Before the inhalation exposure level listed in the labeling has been reached or one of the ventilation criteria established by WAC 296-307-12015 (3)(c) or in the labeling has been met.

- ◆ During any restricted-entry interval.

- The term does not include any person who is only handling pesticide containers that have been emptied or cleaned according to pesticide product labeling instructions or, in the

absence of such instructions, have been subjected to triple-rinsing or its equivalent.

"Handler employer" means any person who is self-employed as a handler or who employs any handler, for any type of compensation.

"Immediate family" includes only spouse, children, step-children, foster children, parents, stepparents, foster parents, brothers, and sisters.

"Nursery" means any operation engaged in the outdoor production of any agricultural plant to produce cut flowers and ferns or plants that will be used in their entirety in another location. Such plants include, but are not limited to, flowering and foliage plants or trees; tree seedlings; live Christmas trees; vegetable, fruit, and ornamental transplants; and turf-grass produced for sod.

"Owner" means any person who has a present possessory interest (fee, leasehold, rental, or other) in an agricultural establishment covered by this chapter. A person who has both leased such agricultural establishment to another person and granted that same person the right and full authority to manage and govern the use of such agricultural establishment is not an owner for purposes of this part.

"Restricted-entry interval" means the time after the end of a pesticide application during which entry into the treated area is restricted.

"Substantial economic loss" means a loss in profitability greater than that which would be expected based on the experience and fluctuations of crop yields in previous years. Only losses caused by the agricultural emergency specific to the affected site and geographic area are considered. The contribution of mismanagement cannot be considered in determining the loss.

"Treated area" means any area to which a pesticide is being directed or has been directed.

"Worker" means any person, including a self-employed person, who is employed for any type of compensation and who is performing activities relating to the production of agricultural plants on an agricultural establishment to which WAC 296-307-120 applies. While persons employed by a commercial pesticide handling establishment are performing tasks as crop advisors, they are not workers covered by the requirements of WAC 296-307-120.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-11005, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-11005, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-20-082, § 296-306A-11005, filed 9/30/96, effective 11/1/96.]

WAC 296-307-11010 General duties and prohibited actions—Worker protection standards—40 CFR, § 170.7.

(1) General duties. The agricultural employer or the handler employer, as appropriate, shall:

(a) Assure that each worker subject to WAC 296-307-120 or each handler subject to WAC 296-307-130 receives the protections required by this part.

(b) Assure that any pesticide to which WAC 296-307-130 applies is used in a manner consistent with the labeling of the pesticide, including the requirements of this part.

(c) Provide, to each person who supervises any worker or handler, information and directions sufficient to assure that each worker or handler receives the protections required by

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this part. Such information and directions shall specify which persons are responsible for actions required to comply with this part.

(d) Require each person who supervises any worker or handler to assure compliance by the worker or handler with the provisions of this part and to assure that the worker or handler receives the protections required by this part.

(2) Prohibited actions. The agricultural employer or the handler employer shall not take any retaliatory action for attempts to comply with this part or any action having the effect of preventing or discouraging any worker or handler from complying or attempting to comply with any requirement of this part.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-11010, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-11010, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-20-082, § 296-306A-11010, filed 9/30/96, effective 11/1/96.]

WAC 296-307-11015 Violations of this part—Worker protection standards—40 CFR, § 170.9.

(1) RCW 15.58.150 (2)(c) provides that it is unlawful for any person ". . . to use or cause to be used any pesticide contrary to label directions . . ." When 40 CFR, Part 170 is referenced on a label, users must comply with all of its requirements except those that are inconsistent with product specific instructions on the labeling. For purposes of this chapter, the term "use" is interpreted to include:

(a) Preapplication activities, including, but not limited to:

(i) Arranging for the application of the pesticide;

(ii) Mixing and loading the pesticide; and

(iii) Making necessary preparations for the application of the pesticide, including responsibilities related to worker notification, training of handlers, decontamination, use and care of personal protective equipment, emergency information, and heat stress management.

(b) Application of the pesticide.

(c) Post-application activities necessary to reduce the risks of illness and injury resulting from handlers' and workers' occupational exposures to pesticide residues during the restricted-entry interval plus thirty days. These activities include, but are not limited to, responsibilities related to worker training, notification, and decontamination.

(d) Other pesticide-related activities, including, but not limited to, providing emergency assistance, transporting or storing pesticides that have been opened, and disposing of excess pesticides, spray mix, equipment wash waters, pesticide containers, and other pesticide-containing materials.

(2) A person who has a duty under this chapter, as referenced on the pesticide product label, and who fails to perform that duty, violates RCW 15.58.330 and 17.21.315, and is subject to civil penalties under RCW 15.58.335, 15.58.260 and 17.21.315.

(3) FIFRA section 14 (b)(4) provides that a person is liable for a penalty under FIFRA if another person employed by or acting for that person violates any provision of FIFRA. The term "acting for" includes both employment and contractual relationships.

(4) The requirements of this chapter, including the decontamination requirements, shall not, for the purposes of

section 653 (b)(1) of Title 29 of the U.S. Code, be deemed to be the exercise of statutory authority to prescribe or enforce standards or regulations affecting the general sanitary hazards addressed by the WISHA Field Sanitation Standard, WAC 296-24-120, or other agricultural, nonpesticide hazards.

[Recodified as § 296-307-11015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-11015, filed 9/30/96, effective 11/1/96.]

Standard for Workers

WAC 296-307-120 Applicability of this section—Standards for workers—40 CFR, § 170.102. Requirement. Except as provided by WAC 296-307-12005 and 296-307-12010, WAC 296-307-120 applies when any pesticide product is used on an agricultural establishment in the production of agricultural plants.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-120, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-120. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-120, filed 9/30/96, effective 11/1/96.]

WAC 296-307-12005 Exceptions—Standards for workers—40 CFR, § 170.103. This section does not apply when any pesticide is applied on an agricultural establishment in the following circumstances:

(1) For mosquito abatement, Mediterranean fruit fly eradication, or similar wide-area public pest control programs sponsored by governmental entities.

(2) On livestock or other animals, or in or about animal premises.

(3) On plants grown for other than commercial or research purposes, which may include plants in habitations, home fruit and vegetable gardens, and home greenhouses.

(4) On plants that are in ornamental gardens, parks, and public or private lawns and grounds that are intended only for aesthetic purposes or climatic modification.

(5) By injection directly into agricultural plants. Direct injection does not include "hack and squirt," "frill and spray," chemigation, soil-incorporation, or soil-injection.

(6) In a manner not directly related to the production of agricultural plants, including, but not limited to, structural pest control, control of vegetation along rights-of-way and in other noncrop areas, and pasture and rangeland use.

(7) For control of vertebrate pests.

(8) As attractants or repellents in traps.

(9) On the harvested portions of agricultural plants or on harvested timber.

(10) For research uses of unregistered pesticides.

[Recodified as § 296-307-12005. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-12005, filed 9/30/96, effective 11/1/96.]

WAC 296-307-12010 Exemptions—Standards for workers—40 CFR, § 170.104. The workers listed in this section are exempt from the specified provisions of WAC 296-307-120.

(1) Owners of agricultural establishments.

(a) The owner of an agricultural establishment is not required to provide to himself/herself or members of his/her

immediate family who are performing tasks related to the production of agricultural plants on their own agricultural establishment the protections of:

(i) WAC 296-307-12020 (3)(e) through (i);

(ii) WAC 296-307-12020 (3)(e) through (i); as referenced in WAC 296-307-12020 (4)(b)(iii) and (5);

(iii) WAC 296-307-12025;

(iv) WAC 296-307-12030;

(v) WAC 296-307-12040;

(vi) WAC 296-307-12045;

(vii) WAC 296-307-12050;

(viii) WAC 296-307-12055.

(b) The owner of the agricultural establishment must provide the protections listed in (a)(i) through (viii) of this subsection to other workers and other persons who are not members of his/her immediate family.

(2) Crop advisors.

(a) Provided that the conditions of this section are met, a person who is certified or licensed as a crop advisor by a program acknowledged as appropriate in writing by EPA or a State or Tribal lead agency for pesticide enforcement, and persons performing crop advising tasks under such qualified crop advisor's direct supervision, are exempt from the provisions of:

(i) WAC 296-307-12050.

(ii) WAC 296-307-12055.

A person is under the direct supervision of a crop advisor when the crop advisor exerts the supervisory controls set out in (b)(iii) and (iv) of this subsection. Direct supervision does not require that the crop advisor be physically present at all times, but the crop advisor must be readily accessible to the employees at all times.

(b) Conditions of exemption.

(i) The certification or licensing program requires pesticide safety training that includes, at least, all the information in WAC 296-307-13025 (3)(d).

(ii) Applies only when performing crop advising tasks in the treated area.

(iii) The crop advisor must make specific determinations regarding the appropriate PPE, appropriate decontamination supplies, and how to conduct the tasks safely. The crop advisor must convey this information to each person under his direct supervision in a language that the person understands.

(iv) Before entering a treated area, the certified or licensed crop advisor must inform, through an established practice of communication, each person under his/her direct supervision of the pesticide product and active ingredient(s) applied, method of application, time of application, the restricted entry interval which tasks to undertake, and how to contact the crop advisor.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-12010, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-12010. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-12010, filed 9/30/96, effective 11/1/96.]

WAC 296-307-12015 Restrictions associated with pesticide applications—Standards for workers—40 CFR, § 170.110. (1) Farms and forests. During the application of any pesticide on a farm or in a forest, the agricultural employer shall not allow or direct any person, other than an

appropriately trained and equipped handler, to enter or to remain in the treated area.

(2) Nurseries. In a nursery, during any pesticide application described in column A of Table 1 of this section, the agricultural employer shall not allow or direct any person,

other than an appropriately trained and equipped handler, to enter or to remain in the area specified in column B of Table 1 of this section. After the application is completed, until the end of any restricted-entry interval, the entry-restricted area is the treated area.

Table 1.—Entry-Restricted Areas in Nurseries During Pesticide Applications

A. During Application of a Pesticide:	B. Workers are Prohibited in:
(1)(a) Applied: (i) Aerially, or (ii) In an upward direction, or (iii) Using a spray pressure greater than 150 psi, or (b) Applied as a: (i) Fumigant, or (ii) Smoke, or (iii) Mist, or (iv) Fog, or (v) Aerosol.	Treated area plus 100 feet in all directions on the nursery
(2)(a) Applied downward using: (i) A height of greater than 12 inches from the planting medium, or (ii) A fine spray, or (iii) A spray pressure greater than 40 psi and less than 150 psi.	Treated area plus 25 feet in all directions on the nursery
(b) Not as in 1 or 2(a) above but for which a respiratory protection device is required for application by the product labeling.	
(3) Applied otherwise.	Treated area
(3) Greenhouses.	
(a) When a pesticide application described in column A of Table 2 under (d) of this subsection takes place in a greenhouse, the agricultural employer shall not allow or direct any person, other than an appropriately trained and equipped handler, to enter or to remain in the area specified in column B of Table 2 until the time specified in column C of Table 2 has expired.	
(b) After the time specified in column C of Table 2 under (d) of this subsection has expired, until the expiration of any restricted-entry interval, the agricultural employer shall not allow or direct any worker to enter or to remain in the treated area as specified in column D of Table 2 under (d) of this subsection, except as provided in WAC 296-307-12020.	
(c) When column C of Table 2 under (d) of this subsection specifies that ventilation criteria must be met, ventilation shall continue until the air concentration is measured to be equal to or less than the inhalation exposure level the labeling requires to be achieved. If no inhalation exposure level is listed on the labeling, ventilation shall continue until after:	
(i) Ten air exchanges are completed; or (ii) Two hours of ventilation using fans or other mechanical ventilating systems; or (iii) Four hours of ventilation using vents, windows or other passive ventilation; or (iv) Eleven hours with no ventilation followed by one hour of mechanical ventilation; or (v) Eleven hours with no ventilation followed by two hours of passive ventilation; or (vi) Twenty-four hours with no ventilation.	
(d) The following Table 2 applies to (a), (b) and (c) of this subsection.	

Table 2.—Greenhouse Entry Restrictions Associated With Pesticide Applications

A. When a Pesticide is Applied:	B. Workers are Prohibited in:	C. Until:	D. After the Expiration of Time in Column C Until the Restricted-Entry Interval Expires, the Entry-Restricted Area is:
(1) As a fumigant	Entire greenhouse plus any adjacent structure that cannot be sealed off from the treated area	The ventilation criteria of (c) of this subsection are met	No entry restrictions after criteria in column C are met
(2) As a:	Entire enclosed area	The ventilation criteria of (c) of this subsection are met	Entire enclosed area is the treated area

A. When a Pesticide is Applied:	B. Workers are Prohibited in:	C. Until:	D. After the Expiration of Time in Column C Until the Restricted-Entry Interval Expires, the Entry-Restricted Area is:
(i) Smoke, or (ii) Mist, or (iii) Fog, or (iv) Aerosol			
(3) Not in 1 or 2 above, and for which a respiratory protection device is required for application by the product labeling	Entire enclosed area	The ventilation criteria of (c) of this subsection are met	Treated area
(4) Not in 1, 2, or 3 above, and: (i) From a height of greater than 12 in. from the planting medium, or (ii) As a fine spray, or (iii) Using a spray pressure greater than 40 psi	Treated area plus 25 feet in all directions in the enclosed area	Application is complete	Treated area
(5) Otherwise	Treated area	Application is complete	Treated area

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-12015, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-12015, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-20-082, § 296-306A-12015, filed 9/30/96, effective 11/1/96.]

WAC 296-307-12020 Entry restrictions—Standards for workers—40 CFR, § 170.112. (1) General restrictions.

(a) After the application of any pesticide on an agricultural establishment, the agricultural employer shall not allow or direct any worker to enter or to remain in the treated area before the restricted-entry interval specified on the pesticide labeling has expired, except as provided in this section.

(b) Entry-restricted areas in greenhouses are specified in column D in Table 2 under WAC 296-307-12015 (3)(d).

(c) When two or more pesticides are applied at the same time, the restricted-entry interval shall be the longest of the applicable intervals.

(d) The agricultural employer shall assure that any worker who enters a treated area under a restricted-entry interval as permitted by subsections (3), (4), and (5) of this section uses the personal protective equipment specified in the product labeling for early entry workers and follows any other requirements on the pesticide labeling regarding early entry.

(2) Exception for activities with no contact. A worker may enter a treated area during a restricted-entry interval if the agricultural employer assures that both of the following are met:

(a) The worker will have no contact with anything that has been treated with the pesticide to which the restricted-entry interval applies, including, but not limited to, soil, water, air, or surfaces of plants; and

(b) No such entry is allowed until any inhalation exposure level listed in the labeling has been reached or any ven-

tilation criteria established by WAC 296-307-12015 (3)(c) or in the labeling have been met.

(3) Exception for short-term activities. A worker may enter a treated area during a restricted-entry interval for short-term activities if the agricultural employer assures that the following requirements are met:

(a) No hand labor activity is performed.

(b) The time in treated areas under a restricted-entry interval for any worker does not exceed one hour in any twenty-four-hour period.

(c) No such entry is allowed for the first four hours following the end of the application, and no such entry is allowed thereafter until any inhalation exposure level listed in the labeling has been reached or any ventilation criteria established by WAC 296-307-12015 (3)(c) or in the labeling have been met.

(d) The personal protective equipment specified on the product labeling for early entry is provided to the worker. Such personal protective equipment shall conform to the following standards:

(i) Personal protective equipment (PPE) means devices and apparel that are worn to protect the body from contact with pesticides or pesticide residues, including, but not limited to, coveralls, chemical-resistant suits, chemical-resistant gloves, chemical-resistant footwear, respiratory protection devices, chemical-resistant aprons, chemical-resistant headgear, and protective eyewear.

(ii) Long-sleeved shirts, short-sleeved shirts, long pants, short pants, shoes, socks, and other items of work clothing are not considered personal protective equipment for the purposes of this section and are not subject to the requirements of this section, although pesticide labeling may require that such work clothing be worn during some activities.

(iii) When "chemical-resistant" personal protective equipment is specified by the product labeling, it shall be made of material that allows no measurable movement of the pesticide being used through the material during use.

(iv) When "waterproof" personal protective equipment is specified by the product labeling, it shall be made of material that allows no measurable movement of water or aqueous solutions through the material during use.

(v) When a "chemical-resistant suit" is specified by the product labeling, it shall be a loose-fitting, one-piece or two-piece, chemical-resistant garment that covers, at a minimum, the entire body except head, hands, and feet.

(vi) When "coveralls" are specified by the product labeling, they shall be a loose-fitting, one-piece or two-piece garment, such as a cotton or cotton and polyester coverall, that covers, at a minimum, the entire body except head, hands, and feet. The pesticide product labeling may specify that the coveralls be worn over a layer of clothing. If a chemical-resistant suit is substituted for coveralls, it need not be worn over a layer of clothing.

(vii) Gloves shall be of the type specified by the product labeling. Gloves or glove linings made of leather, cotton, or other absorbent materials must not be worn for early entry activities unless these materials are listed on the product labeling as acceptable for such use. If chemical-resistant gloves with sufficient durability and suppleness are not obtainable for tasks with roses or other plants with sharp thorns, leather gloves may be worn over chemical-resistant liners. However, once leather gloves have been worn for this use, thereafter they shall be worn only with chemical-resistant liners and they shall not be worn for any other use.

(viii) When "chemical-resistant footwear" is specified by the product labeling, it shall be one of the following types of footwear: Chemical-resistant shoes, chemical-resistant boots, or chemical-resistant shoe coverings worn over shoes or boots. If chemical-resistant footwear with sufficient durability and a tread appropriate for wear in rough terrain is not obtainable for workers, then leather boots may be worn in such terrain.

(ix) When "protective eyewear" is specified by the product labeling, it shall be one of the following types of eyewear: Goggles; face shield; safety glasses with front, brow, and temple protection; or a full-face respirator.

(x) When "chemical-resistant headgear" is specified by the product labeling, it shall be either a chemical-resistant hood or a chemical-resistant hat with a wide brim.

(e) The agricultural employer shall assure that the worker, before entering the treated area, either has read the product labeling or has been informed, in a manner that the worker can understand, of all labeling requirements related to human hazards or precautions, first aid, symptoms of poisoning, personal protective equipment specified for early entry, and any other labeling requirements related to safe use.

(f) The agricultural employer shall assure that:

(i) Workers wear the personal protective equipment correctly for its intended purpose and use personal protective equipment according to manufacturer's instructions.

(ii) Before each day of use, all personal protective equipment is inspected for leaks, holes, tears, or worn places, and any damaged equipment is repaired or discarded.

(iii) Personal protective equipment that cannot be cleaned properly is disposed of in accordance with any applicable federal, state, and local regulations.

(iv) All personal protective equipment is cleaned according to manufacturer's instructions or pesticide product labeling instructions before each day of reuse. In the absence of any such instructions, it shall be washed thoroughly in detergent and hot water.

(v) Before being stored, all clean personal protective equipment is dried thoroughly or is put in a well-ventilated place to dry.

(vi) Personal protective equipment contaminated with pesticides is kept separately and washed separately from any other clothing or laundry.

(vii) Any person who cleans or launders personal protective equipment is informed that such equipment may be contaminated with pesticides, of the potentially harmful effects of exposure to pesticides, and of the correct way(s) to handle and clean personal protective equipment and to protect themselves when handling equipment contaminated with pesticides.

(viii) All clean personal protective equipment is stored separately from personal clothing and apart from pesticide-contaminated areas.

(ix) Each worker is instructed how to put on, use, and remove the personal protective equipment and is informed about the importance of washing thoroughly after removing personal protective equipment.

(x) Each worker is instructed in the prevention, recognition, and first aid treatment of heat-related illness.

(xi) Workers have a clean place(s) away from pesticide-storage and pesticide-use areas for storing personal clothing not in use; putting on personal protective equipment at the start of any exposure period; and removing personal protective equipment at the end of any exposure period.

(g) When personal protective equipment is required by the labeling of any pesticide for early entry, the agricultural employer shall assure that no worker is allowed or directed to perform the early entry activity without implementing, when appropriate, measures to prevent heat-related illness.

(h) During any early entry activity, the agricultural employer shall provide a decontamination site in accordance with WAC 296-307-12050.

(i) The agricultural employer shall not allow or direct any worker to wear home or to take home personal protective equipment contaminated with pesticides.

(4) Declaration of an agricultural emergency.

(a) The director of the Washington state department of agriculture may declare the existence of circumstances causing an agricultural emergency on a particular establishment or establishments.

(b) The director may declare an agricultural emergency based on the reasonably expected certainty of circumstances occurring based on weather or other forecasts that would create conditions that would normally be anticipated to cause an agricultural emergency.

(c) The agricultural employer may determine if the establishment under his/her control is subject to the agricultural emergency declared by the director.

(d) Emergency repair of equipment that is in use and sited within a pesticide treated area under a restricted-entry interval, such as frost protection devices, shall be considered to be an agricultural emergency. The conditions in WAC 16-228-655 shall be met.

(e) Activities that require immediate response such as fire suppression, relocation of greenhouse plants due to power failure, and similar conditions, shall be considered to be agricultural emergencies. The conditions in WAC 16-228-655 shall be met.

(5) Agricultural activities permitted under an agricultural emergency.

(a) A worker may enter a pesticide treated area under a restricted-entry interval in an agricultural emergency to perform tasks, including hand labor tasks, necessary to mitigate the effects of the agricultural emergency if the agricultural employer assures that all the following requirements are met:

(i) No entry is permitted for the first four hours after the pesticide application or the minimum reentry interval allowed by EPA for that product, whichever is less;

(ii) The personal protective equipment specified on the product labeling for early entry is provided to the worker;

(iii) The agricultural employer shall assure that the worker, before entering the treated area, either has read the product labeling or has been informed, in a manner the worker can understand, of all labeling requirements related to human hazards or precautions, first aid, symptoms of poisoning, personal protective equipment specified for early entry, and any other labeling requirements related to safe use;

(iv) The agricultural employer shall assure that the worker wears the proper PPE and that the PPE is in operable condition and that the worker has been trained in its proper use;

(v) The agricultural employer shall assure that measures have been taken, when appropriate, to prevent heat-related illness;

(vi) A decontamination site has been provided in accordance with EPA regulations;

(vii) The agricultural employer shall not allow or direct any worker to wear home or take home personal protective equipment contaminated with pesticides.

(b) If the agricultural emergency is due to equipment failure, then the agricultural employer shall assure that all the requirements in subsection (1) of this section are met plus the following additional requirement. The only permitted activity until the restricted-entry interval has elapsed is equipment repair that would mitigate the effect of the equipment failure.

(6) Recordkeeping required for agricultural emergencies.

(a) If the employer declares that his/her establishment is affected by an agricultural emergency and that activities regulated by the worker protection standard have been performed, the employer shall keep the following records for seven years from the date of the agricultural emergency:

(i) Date of the agricultural emergency;

(ii) Time of the agricultural emergency, start and end;

(iii) Reason for the agricultural emergency, such as frost, fire, equipment failure, etc.;

(iv) Crop/site;

(v) Pesticide(s) - name, EPA number, REI;

(vi) Name, date, time of entry and exit of early entry person(s);

(vii) Estimated potential of economic loss which would have occurred had no early entry been allowed.

(b) Records shall be completed within twenty-four hours of the early entry exposure and be available to the department and/or department of health and/or medical facility or treating physician if requested by the above or the employee.

(7) Exception to entry restrictions requiring EPA approval. EPA may in accordance with 40 CFR, Part 170.112(e) grant an exception from the requirements of this section. A request for an exception must be submitted to the Director, Office of Pesticide Programs (H-7501C), Environmental Protection Agency, 401 "M" Street SW, Washington, DC 20460 and must be accompanied by two copies of the information specified in 40 CFR, Part 170.112(e).

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-12020, filed 12/11/98, effective 3/1/99; Recodified as § 296-307-12020, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-20-082, § 296-306A-12020, filed 9/30/96, effective 11/1/96.]

WAC 296-307-12025 Notice of applications—Standards for workers—40 CFR, § 170.120. (1) Notification to workers of pesticide applications in greenhouses. The agricultural employer shall notify workers of any pesticide application in the greenhouse in accordance with this subsection.

(a) All pesticide applications shall be posted in accordance with subsection (3) of this section.

(b) If the pesticide product labeling has a statement requiring both the posting of treated areas and oral notification to workers, the agricultural employer shall also provide oral notification of the application to the worker in accordance with subsection (4) of this section.

(c) Notice need not be given to a worker if the agricultural employer can assure that one of the following is met:

(i) From the start of the application until the end of the application and during any restricted-entry interval, the worker will not enter, work in, remain in, or pass through the greenhouse; or

(ii) The worker applied (or supervised the application of) the pesticide for which the notice is intended and is aware of all information required by subsection (4)(a) through (c) of this section.

(2) Notification to workers on farms, in nurseries, or in forests of pesticide applications. The agricultural employer shall notify workers of any pesticide application on the farm or in the nursery or forest in accordance with this subsection.

(a) If the pesticide product labeling has a statement requiring both the posting of treated areas and oral notification to workers, the agricultural employer shall post signs in accordance with subsection (3) of this section and shall provide oral notification of the application to the worker in accordance with subsection (4) of this section.

(b) For any pesticide other than those for which the labeling requires both posting and oral notification of applications, the agricultural employer shall give notice of the application to the worker either by the posting of warning signs in accordance with subsection (3) of this section or orally in accordance with subsection (4) of this section, and

shall inform the workers as to which method of notification is in effect.

(c) Notice need not be given to a worker if the agricultural employer can assure that one of the following is met:

(i) From the start of the application until the end of the application and during any restricted-entry interval, the worker will not enter, work in, remain in, or pass through on foot the treated area or any area within one-quarter mile of the treated area; or

(ii) The worker applied (or supervised the application of) the pesticide for which the notice is intended and is aware of all information required by subsection (4)(a) through (c) of this section.

(3) Posted warning signs. The agricultural employer shall post warning signs in accordance with the following criteria:

(a) The warning sign shall have a background color that contrasts with red. The words "DANGER" and "PELIGRO," plus "PESTICIDES" and "PESTICIDAS," shall be at the top of the sign, and the words "KEEP OUT" and "NO ENTRE" shall be at the bottom of the sign. Letters for all words must be clearly legible. A circle containing an upraised hand on the left and a stern face on the right must be near the center of the sign. The inside of the circle must be red, except that the hand and a large portion of the face must be in a shade that contrasts with red. The length of the hand must be at least twice the height of the smallest letters. The length of the face must be only slightly smaller than the hand. Additional information such as the name of the pesticide and the date of application may appear on the warning sign if it does not detract from the appearance of the sign or change the meaning of the required information. A black and white example of a warning sign meeting these requirements, other than the size requirements, follows:



(b) The standard sign shall be at least fourteen inches by sixteen inches with letters at least one inch in height. Farms

(1999 Ed.)

and forests shall use the standard size sign unless a smaller sign is necessary because the treated area is too small to accommodate a sign of this size. In nurseries and greenhouses, the agricultural employer may, at any time, use a sign smaller than the standard size sign. Whenever a small sign is used on any establishment, there are specific posting distances depending on the size of the lettering and symbol on the sign. If a sign is used with DANGER and PELIGRO in letters at least 7/8 inch in height and the remaining letters at least 1/2 inch and a red circle at least three inches in diameter containing an upraised hand and a stern face, the signs shall be no further than fifty feet apart. If a sign is used with DANGER and PELIGRO in letters at least 7/16 inch in height and the remaining letters at least 1/4 inch in height and a red circle at least 1 1/2 inches in diameter containing an upraised hand and stern face, the signs shall be no further than twenty-five feet apart. A sign with DANGER and PELIGRO in letters less than 7/16 inch in height or with any words in letters less than 1/4 inch in height, or a red circle smaller than 1 1/2 inches in diameter containing an upraised hand and a stern face will not satisfy the requirements of the rule. All signs must meet the requirements of (a) of this subsection.

(c) The employer may replace the Spanish portion of the warning sign with a non-English language read by the largest group of workers who do not read English. The replacement sign must be in the same format as the original sign and must be visible and legible.

(d) On farms and in forests and nurseries, the signs shall be visible from all usual points of worker entry to the treated area, including at least each access road, each border with any labor camp adjacent to the treated area, and each footpath and other walking route that enters the treated area. When there are no usual points of worker entry, signs shall be posted in the corners of the treated area or in any other location affording maximum visibility.

(e) In greenhouses, the signs shall be posted so they are visible from all usual points of worker entry to the treated area including each aisle or other walking route that enters the treated area. When there are no usual points of worker entry to the treated area, signs shall be posted in the corners of the treated area or in any other location affording maximum visibility.

(f) The signs shall:

(i) Be posted no sooner than twenty-four hours before the scheduled application of the pesticide.

(ii) Remain posted throughout the application and any restricted-entry interval.

(iii) Be removed within three days after the end of the application and any restricted-entry interval and before agricultural-worker entry is permitted, other than entry permitted by WAC 296-307-12020.

(g) The signs shall remain visible and legible during the time they are posted.

(h) When several contiguous areas are to be treated with pesticides on a rotating or sequential basis, the entire area may be posted. Worker entry, other than entry permitted by WAC 296-307-12020, is prohibited for the entire area while the signs are posted.

(4) Oral warnings. The agricultural employer shall provide oral warnings to workers in a manner that the worker can

understand. If a worker will be on the premises during the application, the warning shall be given before the application takes place. Otherwise, the warning shall be given at the beginning of the worker's first work period during which the application is taking place or the restricted-entry interval for the pesticide is in effect. The warning shall consist of:

- (a) The location and description of the treated area.
- (b) The time during which entry is restricted.
- (c) Instructions not to enter the treated area until the restricted-entry interval has expired.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-12025, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-12025, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-20-082, § 296-306A-12025, filed 9/30/96, effective 11/1/96.]

WAC 296-307-12030 Providing specific information about applications—Standards for workers—40 CFR, § 170.122. When workers are on an agricultural establishment and, within the last thirty days, a pesticide covered by this part has been applied on the establishment or a restricted-entry interval has been in effect, the agricultural employer shall display, in accordance with this section, specific information about the pesticide.

(1) Location, accessibility, and legibility. The information shall be displayed in the location specified for the pesticide safety poster in WAC 296-307-12045(4) and shall be accessible and legible, as specified in WAC 296-307-12045(4) and (6).

(2) Timing.

(a) If warning signs are posted for the treated area before an application, the specific application information for that application shall be posted at the same time or earlier.

(b) The information shall be posted before the application takes place, if workers will be on the establishment during application. Otherwise, the information shall be posted at the beginning of any worker's first work period.

(c) The information shall continue to be displayed for at least thirty days after the end of the restricted-entry interval (or, if there is no restricted-entry interval, for at least thirty days after the end of the application) or at least until workers are no longer on the establishment, whichever is earlier.

(3) Required information. The information shall include:

(a) The location and description of the treated area.

(b) The product name, EPA registration number, and active ingredient(s) of the pesticide.

(c) The time and date the pesticide is to be applied.

(d) The restricted-entry interval for the pesticide.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-12030, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-12030, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-20-082, § 296-306A-12030, filed 9/30/96, effective 11/1/96.]

WAC 296-307-12035 Notice of applications to handler employers—Standards for workers—40 CFR, § 170.124. Whenever handlers who are employed by a commercial pesticide handling establishment will be performing pesticide handling tasks on an agricultural establishment, the agricultural employer shall provide to the handler employer, or assure that the handler employer is aware of, the following information concerning any areas on the agricultural estab-

lishment that the handler may be in (or may walk within one-quarter mile of) and that may be treated with a pesticide or that may be under a restricted-entry interval while the handler will be on the agricultural establishment:

(1) Specific location and description of any such areas; and

(2) Restrictions on entering those areas.

[Recodified as § 296-307-12035, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-20-08, § 296-306A-12035, filed 9/30/96, effective 11/1/96.]

WAC 296-307-12040 Pesticide safety training—Standards for workers—40 CFR, § 170.130. (1) General requirement.

(a) Agricultural employer assurance. The agricultural employer shall assure that each worker, required by this section to be trained, has been trained according to this section during the last five years, counting from the end of the month in which the training was completed.

Note: In addition to the training required by this section, the agricultural employer shall assure without exception, that all employees are trained in accordance with WAC 296-62-054 through 296-62-05427, Hazard communication.

(b) Requirement for workers performing early entry activities. Before a worker enters a treated area on the agricultural establishment during a restricted-entry interval to perform early entry activities permitted by WAC 296-307-12020 and contacts anything that has been treated with the pesticide to which the restricted-entry interval applies, including but not limited to, soil, water, or surfaces of plants, the agricultural employer shall assure that the worker has been trained.

(c) Requirements for other agricultural workers.

(i) Information before entry. Except as provided in (b) of this subsection, before a worker enters any areas on the agricultural establishment where, within the last thirty days a pesticide to which this part applies has been applied or the restricted-entry interval for such pesticide has been in effect, the agricultural employer shall assure that the worker has been provided the pesticide safety information specified in subsection (3) of this section, in a manner that agricultural workers can understand, such as by providing written materials or oral communication or by other means. The agricultural employer must be able to verify compliance with this requirement.

(ii) Training before the start of a work period. The agricultural employer shall assure that a worker has been trained before the worker enters any areas on the agricultural establishment where, within the last thirty days a pesticide to which this chapter applies has been applied or a restricted-entry interval for such pesticide has been in effect, the agricultural employer shall assure that the worker has been trained.

(2) Exceptions. The following persons need not be trained under this section:

(a) A worker who is currently certified as an applicator of restricted-use pesticides under chapter 17.21 RCW.

(b) A worker who satisfies the training requirements of chapter 17.21 RCW.

(c) A worker who satisfies the handler training requirements of WAC 296-307-13025(3).

(d) A worker who is certified or licensed as a crop advisor by the Washington state department of agriculture under RCW 15.58.230: *Provided*, That a requirement for such certification or licensing is pesticide safety training that includes all the information set out in WAC 296-307-13025 (3)(d).

(3) Training programs.

(a) General pesticide safety information shall be presented to workers either orally from written materials or audiovisually. The information must be presented in a manner that the workers can understand (such as through a translator) using nontechnical terms. The presenter also shall respond to workers' questions.

(b) The person who conducts the training shall meet at least one of the following criteria:

(i) Be currently certified as an applicator of restricted-use pesticides under chapter 17.21 RCW; or

(ii) Be currently designated as a trainer of certified applicators or pesticide handlers by the Washington state department of agriculture in accordance with chapters 15.58 and 17.21 RCW; or

(iii) Have completed a pesticide safety train-the-trainer program approved by the Washington state department of agriculture in accordance with chapters 15.58 and 17.21 RCW; or

(iv) Satisfy the training requirements in WAC 296-307-13025(3).

(c) Any person who issues a Washington state department of agriculture-approved Worker Protection Standard worker training card must assure that the worker who receives the training card has been trained in accordance with subsection (4)(d) of this section.

(d) The training materials shall convey, at a minimum, the following information:

(i) Where and in what form pesticides may be encountered during work activities.

(ii) Hazards of pesticides resulting from toxicity and exposure, including acute and chronic effects, delayed effects, and sensitization.

(iii) Routes through which pesticides can enter the body, including information on wearing work clothing that protects the body from pesticide residues.

(iv) Signs and symptoms of common types of pesticide poisoning.

(v) Emergency first aid for pesticide injuries or poisonings.

(vi) How to obtain emergency medical care.

(vii) Routine and emergency decontamination procedures, including preventing pesticides from entering the body by:

■ Emergency eyeflushing techniques;

■ Washing work clothes separately from other clothes before wearing them again;

■ Washing before eating, drinking, using chewing gum or tobacco, or using the toilet;

■ Washing/showering with soap and water, shampooing hair, and putting on clean clothes after work; and

■ Washing immediately in the nearest clean water if pesticides are spilled on the body. As soon as possible shower, shampoo, and change into clean clothes.

(viii) Hazards from chemigation and drift.

(ix) Hazards from pesticide residues on clothing.

(x) Warnings about taking pesticides or pesticide containers home.

(xi) Requirements of this part designed to reduce the risks of illness or injury resulting from workers' occupational exposure to pesticides, including application and entry restrictions, the design of the warning sign, posting of warning signs, oral warnings, the availability of specific information about applications, and the protection against retaliatory acts.

(4) Verification of training.

(a) Except as provided in subsection (4)(b) of this section, if the agricultural employer assures that a worker possesses a Washington state department of agriculture-approved Worker Protection Standard worker training card, then the requirements of subsection (1) of this section will have been met.

(b) If the agricultural employer is aware or has reason to know that a Washington state department of agriculture-approved Worker Protection Standard worker training card has not been issued in accordance with this section, or has not been issued to the worker bearing the card, or the training was completed more than five years before the beginning of the current month, a worker's possession of that certificate does not meet the requirements of subsection (1) of this section.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-12040, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-12040, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-20-082, § 296-306A-12040, filed 9/30/96, effective 11/1/96.]

WAC 296-307-12045 Posted pesticide safety information—Standards for workers—40 CFR, § 170.135. (1) Requirement. When workers are on an agricultural establishment and, within the last thirty days, a pesticide covered by this part has been applied on the establishment or a restricted-entry interval has been in effect, the agricultural employer shall display, in accordance with this section, pesticide safety information.

(2) Pesticide safety poster. A safety poster must be displayed that conveys, at a minimum, the following basic pesticide safety concepts:

(a) Help keep pesticides from entering your body. At a minimum, the following points shall be conveyed:

(i) Avoid getting on your skin or into your body any pesticides that may be on plants and soil, in irrigation water, or drifting from nearby applications.

(ii) Wash before eating, drinking, using chewing gum or tobacco, or using the toilet.

(iii) Wear work clothing that protects the body from pesticide residues (long-sleeved shirts, long pants, shoes and socks, and a hat or scarf).

(iv) Wash/shower with soap and water, shampoo hair, and put on clean clothes after work.

(v) Wash work clothes separately from other clothes before wearing them again.

(vi) Wash immediately in the nearest clean water if pesticides are spilled or sprayed on the body. As soon as possible, shower, shampoo, and change into clean clothes.

(vii) Follow directions about keeping out of treated or restricted areas.

(b) There are federal rules to protect workers and handlers, including a requirement for safety training.

(3) Emergency medical care information.

(a) The name, address, and telephone number of the nearest emergency medical care facility shall be on the safety poster or displayed close to the safety poster.

(b) The agricultural employer shall inform workers promptly of any change to the information on emergency medical care facilities.

(4) Location.

(a) The information shall be displayed in a central location on the farm or in the nursery or greenhouse where it can be readily seen and read by workers.

(b) The information shall be displayed in a location in or near the forest in a place where it can be readily seen and read by workers and where workers are likely to congregate or pass by, such as at a decontamination site or an equipment storage site.

(5) Accessibility. Workers shall be informed of the location of the information and shall be allowed access to it.

(6) Legibility. The information shall remain legible during the time it is posted.

[Recodified as § 296-307-12045. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-12045, filed 9/30/96, effective 11/1/96.]

WAC 296-307-12050 Decontamination—Standards for workers—40 CFR, § 170.150. (1) Requirements. The agricultural employer must provide decontamination supplies for workers in accordance with this section whenever:

(a) Any worker on the agricultural establishment is performing an activity in the area where a pesticide was applied or a restricted-entry interval (REI) was in effect within the last thirty days; and

(b) The worker contacts anything that has been treated with the pesticide including but not limited to soil, water, plants, plant surfaces, and plant parts;

(c) *Exception.* The thirty-day time period established in (a) of this subsection shall not apply if the only pesticides used in the treated area are products with an REI of four hours or less on the label (but not a product without an REI on the label). When workers are in such treated areas, the agricultural employer shall provide decontamination supplies for not less than seven days following the expiration of any applicable REI.

(2) General conditions.

(a) The agricultural employer shall provide workers with adequate water for routine washing and emergency eyeflushing. At all times when the water is available to workers, the employer shall assure that it is of a quality and temperature that will not cause illness or injury when it contacts the skin or eyes or if it is swallowed.

(b) When water stored in a tank is to be used for mixing pesticides, it shall not be used for decontamination or eyeflushing, unless the tank is equipped with properly functioning valves or other mechanisms that prevent movement of pesticides into the tank.

(c) The agricultural employer shall provide soap and single-use towels in quantities sufficient to meet workers' needs.

(d) To provide for emergency eyeflushing, the agricultural employer shall assure that at least one pint of water is

immediately available to each worker who is performing early entry activities permitted by WAC 296-307-12020 and for which the pesticide labeling requires protective eyewear. The eyeflush water shall be carried by the early entry worker, or shall be on the vehicle the early entry worker is using, or shall be otherwise immediately accessible.

(3) Location.

(a) The decontamination supplies shall be located together and shall be reasonably accessible to and not more than one-quarter mile from where workers are working.

(b) For worker activities performed more than one-quarter mile from the nearest place of vehicular access:

(i) The soap, single-use towels, and water may be at the nearest place of vehicular access.

(ii) The agricultural employer may permit workers to use clean water from springs, streams, lakes, or other sources for decontamination at the remote work site, if such water is more accessible than the water located at the nearest place of vehicular access.

(c) The decontamination supplies shall not be in an area being treated with pesticides.

(d) The decontamination supplies shall not be maintained in an area that is under a restricted-entry interval, unless the workers for whom the decontamination supplies are provided are performing early entry activities permitted by WAC 296-307-12020 and involving contact with treated surfaces and the decontamination supplies would otherwise not be reasonably accessible to those workers.

(4) Decontamination after early entry activities. At the end of any exposure period for workers engaged in early entry activities permitted by WAC 296-307-12020 and involving contact with anything that has been treated with the pesticide to which the restricted-entry interval applies, including, but not limited to, soil, water, air, or surfaces of plants, the agricultural employer shall provide, at the site where the workers remove personal protective equipment, soap, clean towels, and an adequate amount of water so that the workers may wash thoroughly. At least ten gallons of water for one employee and twenty gallons of water for two or more employees shall be provided at early entry sites that do not have running water.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-12050, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-12050. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-12050, filed 9/30/96, effective 11/1/96.]

WAC 296-307-12055 Emergency assistance—Standards for workers—40 CFR, § 170.160. If there is reason to believe that a person who is or has been employed on an agricultural establishment to perform tasks related to the production of agricultural plants has been poisoned or injured by exposure to pesticides used on the agricultural establishment, including, but not limited to, exposures from application, splash, spill, drift, or pesticide residues, the agricultural employer shall:

(1) Make available to that person prompt transportation from the agricultural establishment, including any labor camp on the agricultural establishment, to an appropriate emergency medical facility.

(2) Provide to that person or to treating medical personnel, promptly upon request, any obtainable information on:

(a) Product name, EPA registration number, and active ingredients of any product to which that person might have been exposed.

(b) Antidote, first aid, and other medical information from the product labeling.

(c) The circumstances of application or use of the pesticide on the agricultural establishment.

(d) The circumstances of exposure of that person to the pesticide.

[Recodified as § 296-307-12055, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-20-082, § 296-306A-12055, filed 9/30/96, effective 11/1/96.]

Standard for Pesticide Handlers

WAC 296-307-130 Applicability of this section—Standards for pesticide handlers—40 CFR, § 170.202. (1) Requirement. Except as provided by subsection (2) of this section, WAC 296-307-130 applies when any pesticide is handled for use on an agricultural establishment.

(2) Exceptions. WAC 296-307-130 does not apply when any pesticide is handled for use on an agricultural establishment in the following circumstances:

(a) For mosquito abatement, Mediterranean fruit fly eradication, or similar wide-area public pest control programs sponsored by governmental entities.

(b) On livestock or other animals, or in or about animal premises.

(c) On plants grown for other than commercial or research purposes, which may include plants in habitations, home fruit and vegetable gardens, and home greenhouses.

(d) On plants that are in ornamental gardens, parks, and public or private lawns and grounds and that are intended only for aesthetic purposes or climatic modification.

(e) In a manner not directly related to the production of agricultural plants, including, but not limited to, structural pest control, control of vegetation along rights-of-way and in other noncrop areas, and pasture and rangeland use.

(f) For control of vertebrate pests.

(g) As attractants or repellents in traps.

(h) On the harvested portions of agricultural plants or on harvested timber.

(i) For research uses of unregistered pesticides.

(j) Exemptions. Except as provided by WAC 296-307-130 and 296-307-13005, WAC 296-307-130 applies when a pesticide is handled for an agricultural establishment.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-130, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-130, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-20-082, § 296-306A-130, filed 9/30/96, effective 11/1/96.]

WAC 296-307-13005 Exemptions—Standards for handlers—40 CFR, § 170.204. The handlers listed in this section are exempt from the specified provisions of this part.

(1) Owners of agricultural establishments.

(a) The owner of an agricultural establishment is not required to provide to himself or members of his immediate family who are performing handling tasks on their own agricultural establishment the protections of:

(i) WAC 296-307-13010 (2) and (3).

(ii) WAC 296-307-13015.

(iii) WAC 296-307-13025.

(iv) WAC 296-307-13030.

(v) WAC 296-307-13035.

(vi) WAC 296-307-13040.

(vii) WAC 296-307-13045 (5) through (7).

(viii) WAC 296-307-13050.

(ix) WAC 296-307-13055.

(b) The owner of the agricultural establishment must provide the protections listed in subsection (1)(a)(i) through (ix) of this section to other handlers and other persons who are not members of his immediate family.

(2) Crop advisors.

(a) Provided that the conditions of (b) of this subsection are met, a person who is certified or licensed as a crop advisor by the Washington state department of agriculture under RCW 15.58.230, and persons performing crop advising tasks under such qualified crop advisor's direct supervision, are exempt from the provisions of:

(i) WAC 296-307-13030.

(ii) WAC 296-307-13045.

(iii) WAC 296-307-13050.

(iv) WAC 296-307-13055.

A person is under the direct supervision of a crop advisor when the crop advisor exerts the supervisory controls set out in (b)(iv) and (v) of this subsection. Direct supervision does not require that the crop advisor be physically present at all times, but the crop advisor must be readily accessible to the employees at all times.

(b) Conditions of exemption.

(i) The certification or licensing program requires pesticide safety training that includes, at least, all the information in WAC 296-307-13025 (3)(d).

(ii) No entry into the treated area occurs until after application ends.

(iii) Applies only when performing crop advising tasks in the treated area.

(iv) The crop advisor must make specific determinations regarding the appropriate PPE, appropriate decontamination supplies, and how to conduct the tasks safely. The crop advisor must convey this information to each person under his direct supervision in a language that the person understands.

(v) Before entering a treated area, the certified or licensed crop advisor must inform, through an established practice of communication, each person under his direct supervision of the pesticide products and active ingredient(s) applied, method of application, time of application, the restricted-entry interval, which tasks to undertake, and how to contact the crop advisor.

(c) Applies only when the persons are performing crop advising tasks in the treated area.

(d) The crop advisor must make specific determinations regarding the appropriate PPE, appropriate decontamination supplies, and how to conduct the tasks safely. The crop advisor must convey this information to each person under his direct supervision in a language that the person understands.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-13005, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-13005, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050

and [49.17.]060. 96-20-082, § 296-306A-13005, filed 9/30/96, effective 11/1/96.]

WAC 296-307-13010 Restrictions during applications—Standards for pesticide handlers—40 CFR, § 170.210. (1) Contact with workers and other persons. The handler employer and the handler shall assure that no pesticide is applied so as to contact, either directly or through drift, any worker or other person, other than an appropriately trained and equipped handler.

(2) Handlers handling highly toxic pesticides. The handler employer shall assure that any handler who is performing any handling activity with a product that has the skull and crossbones symbol on the front panel of the label is monitored visually or by voice communication at least every two hours.

(3) Fumigant applications in greenhouses. The handler employer shall assure:

(a) That any handler who handles a fumigant in a greenhouse, including a handler who enters the greenhouse before the acceptable inhalation exposure level or ventilation criteria have been met to monitor air levels or to initiate ventilation, maintains continuous visual or voice contact with another handler.

(b) That the other handler has immediate access to the personal protective equipment required by the fumigant labeling for handlers in the event entry into the fumigated greenhouse becomes necessary for rescue.

[Recodified as § 296-307-13010. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-13010, filed 9/30/96, effective 11/1/96.]

WAC 296-307-13015 Providing specific information about applications—Standards for pesticide handlers—40 CFR, § 170.222. When handlers (except those employed by a commercial pesticide handling establishment) are on an agricultural establishment and, within the last thirty days, a pesticide covered by this part has been applied on the establishment or a restricted-entry interval has been in effect, the handler employer shall display, in accordance with this section, specific information about the pesticide.

(1) Location, accessibility, and legibility. The information shall be displayed in the same location specified for the pesticide safety poster in WAC 296-307-13040(4) and shall be accessible and legible, as specified in WAC 296-307-13040 (5) and (6).

(2) Timing.

(a) If warning signs are posted for the treated area before an application, the specific application information for that application shall be posted at the same time or earlier.

(b) The information shall be posted before the application takes place, if handlers (except those employed by a commercial pesticide handling establishment) will be on the establishment during application. Otherwise, the information shall be posted at the beginning of any such handler's first work period.

(c) The information shall continue to be displayed for at least thirty days after the end of the restricted-entry interval (or, if there is no restricted-entry interval, for at least thirty days after the end of the application) or at least until the handlers are no longer on the establishment, whichever is earlier.

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- (3) Required information. The information shall include:
- (a) The location and description of the treated area.
 - (b) The product name, EPA registration number, and active ingredient(s) of the pesticide.
 - (c) The time and date the pesticide is to be applied.
 - (d) The restricted-entry interval for the pesticide.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-13015, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-13015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-13015, filed 9/30/96, effective 11/1/96.]

WAC 296-307-13020 Notice of applications to agricultural employers—Standards for pesticide handlers—40 CFR, § 170.224. Before the application of any pesticide on or in an agricultural establishment, the handler employer shall provide the following information to any agricultural employer for the establishment or shall assure that any agricultural employer is aware of:

- (1) Specific location and description of the treated area.
- (2) Time and date of application.
- (3) Product name, EPA registration number, and active ingredient(s).
- (4) Restricted-entry interval.
- (5) Whether posting and oral notification are required.
- (6) Any other product-specific requirements on the product labeling concerning protection of workers or other persons during or after application.

[Recodified as § 296-307-13020. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-13020, filed 9/30/96, effective 11/1/96.]

WAC 296-307-13025 Pesticide safety training—Standards for pesticide handlers—40 CFR, § 170.230. (1) Requirement. Before any handler performs any handling task, the handler employer shall assure that the handler has been trained in accordance with this section during the last five years, counting from the end of the month in which the training was completed.

Note: In addition to the training required by this section, the agricultural employer shall assure, without exception, that all employees are trained in accordance with WAC 296-62-054 through 296-62-05427, Hazard communication.

(2) Exceptions. The following persons need not be trained under this section:

(a) A handler who is currently certified as an applicator of restricted-use pesticides under chapter 17.21 RCW.

(b) A handler who is certified or licensed as a crop advisor by the Washington state department of agriculture under RCW 15.58.230: Provided, That a requirement for such certification or licensing is pesticide safety training that includes all the information set out in WAC 296-307-13025 (3)(d).

(3) Training programs.

(a) General pesticide safety information shall be presented to handlers either orally from written materials or audiovisually. The information must be presented in a manner that the handlers can understand (such as through a translator). The presenter also shall respond to handlers' questions.

(b) The person who conducts the training shall meet at least one of the following criteria:

(i) Be currently certified as an applicator of restricted-use pesticides under chapter 17.21 RCW; or

(ii) Be currently designated as a trainer of certified applicators or pesticide handlers by the Washington state department of agriculture under chapters 15.58 or 17.21 RCW; or

(iii) Have completed a pesticide safety train-the-trainer program approved by a state, federal, or tribal agency having jurisdiction.

(c) Any person who issues a Washington state department of agriculture-approved Worker Protection Standard handler training card must assure that the handler who receives the training card has been trained in accordance with (d) of this subsection.

(d) The pesticide safety training materials must convey, at a minimum, the following information:

(i) Format and meaning of information contained on pesticide labels and in labeling, including safety information such as precautionary statements about human health hazards.

(ii) Hazards of pesticides resulting from toxicity and exposure, including acute and chronic effects, delayed effects, and sensitization.

(iii) Routes by which pesticides can enter the body.

(iv) Signs and symptoms of common types of pesticide poisoning.

(v) Emergency first aid for pesticide injuries or poisonings.

(vi) How to obtain emergency medical care.

(vii) Routine and emergency decontamination procedures.

(viii) Need for and appropriate use of personal protective equipment.

(ix) Prevention, recognition, and first-aid treatment of heat-related illness.

(x) Safety requirements for handling, transporting, storing, and disposing of pesticides, including general procedures for spill cleanup.

(xi) Environmental concerns such as drift, runoff, and wildlife hazards.

(xii) Warnings about taking pesticides or pesticide containers home.

(xiii) Requirements of this part that must be followed by handler employers for the protection of handlers and other persons, including the prohibition against applying pesticides in a manner that will cause contact with workers or other persons, the requirement to use personal protective equipment, the provisions for training and decontamination, and the protection against retaliatory acts.

(4) Verification of training.

(a) Except as provided in (b) of this subsection, if the handler employer assures that a handler possesses a Washington state department of agriculture-approved Worker Protection Standard handler training card, then the requirements of subsection (1) of this section will have been met.

(b) If the handler employer is aware or has reason to know that a Washington state department of agriculture-approved Worker Protection Standard handler training card has not been issued in accordance with this section, or has not been issued to the handler bearing the card, or the handler training was completed more than five years before the

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beginning of the current month, a handler's possession of that card does not meet the requirements of subsection (1) of this section.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-13025, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-13025, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-20-082, § 296-306A-13025, filed 9/30/96, effective 11/1/96.]

WAC 296-307-13030 Knowledge of labeling and site-specific information—Standards for pesticide handlers—40 CFR, § 170.232. (1) Knowledge of labeling information.

(a) The handler employer shall assure that before the handler performs any handling activity, the handler either has read the product labeling or has been informed in a manner the handler can understand of all labeling requirements related to safe use of the pesticide, such as signal words, human hazard precautions, personal protective equipment requirements, first-aid instructions, environmental precautions, and any additional precautions pertaining to the handling activity to be performed.

(b) The handler employer shall assure that the handler has access to the product labeling information during handling activities.

(2) Knowledge of site-specific information. Whenever a handler who is employed by a commercial pesticide handling establishment will be performing pesticide handling tasks on an agricultural establishment, the handler employer shall assure that the handler is aware of the following information concerning any areas on the agricultural establishment that the handler may be in (or may walk within one-quarter mile of) and that may be treated with a pesticide or that may be under a restricted-entry interval while the handler will be on the agricultural establishment:

(a) Specific location and description of any such areas; and

(b) Restrictions on entering those areas.

[Recodified as § 296-307-13030, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-20-082, § 296-306A-13030, filed 9/30/96, effective 11/1/96.]

WAC 296-307-13035 Safe operation of equipment—Standards for pesticide handlers—40 CFR, § 170.234. (1) The handler employer shall assure that before the handler uses any equipment for mixing, loading, transferring, or applying pesticides, the handler is instructed in the safe operation of such equipment, including, when relevant, chemigation safety requirements and drift avoidance.

(2) The handler employer shall assure that, before each day of use, equipment used for mixing, loading, transferring, or applying pesticides is inspected for leaks, clogging, and worn or damaged parts, and any damaged equipment is repaired or is replaced.

(3) Before allowing any person to repair, clean, or adjust equipment that has been used to mix, load, transfer, or apply pesticides, the handler employer shall assure that pesticide residues have been removed from the equipment, unless the person doing the cleaning, repairing, or adjusting is a handler employed by the agricultural or commercial pesticide handling establishment. If pesticide residue removal is not feasi-

ble, the handler employer shall assure that the person who repairs, cleans, or adjusts such equipment is informed:

(a) That such equipment may be contaminated with pesticides.

(b) Of the potentially harmful effects of exposure to pesticides.

(c) Of the correct way to handle such equipment.

[Recodified as § 296-307-13035. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-13035, filed 9/30/96, effective 11/1/96.]

WAC 296-307-13040 Posted pesticide safety information—Standards for pesticide handlers—40 CFR, § 170.235. (1) Requirement. When handlers (except those employed by a commercial pesticide handling establishment) are on an agricultural establishment and, within the last thirty days, a pesticide covered by this part has been applied on the establishment or a restricted-entry interval has been in effect, the handler employer shall display, in accordance with this section, pesticide safety information.

(2) Pesticide safety poster. A safety poster must be displayed that conveys, at a minimum, the following basic pesticide safety concepts:

(a) Help keep pesticides from entering your body. At a minimum, the following points shall be conveyed:

(i) Avoid getting on your skin or into your body any pesticides that may be on plants and soil, in irrigation water, or drifting from nearby applications.

(ii) Wash before eating, drinking, using chewing gum or tobacco, or using the toilet.

(iii) Wear work clothing that protects the body from pesticide residues (long-sleeved shirts, long pants, shoes and socks, and a hat or scarf).

(iv) Wash/shower with soap and water, shampoo hair, and put on clean clothes after work.

(v) Wash work clothes separately from other clothes before wearing them again.

(vi) Wash immediately in the nearest clean water if pesticides are spilled or sprayed on the body. As soon as possible, shower, shampoo, and change into clean clothes.

(vii) Follow directions about keeping out of treated or restricted areas.

(b) There are federal rules to protect workers and handlers including a requirement for safety training.

(3) Emergency medical care information.

(a) The name, address, and telephone number of the nearest emergency medical care facility shall be on the safety poster or displayed close to the safety poster.

(b) The handler employer shall inform handlers promptly of any change to the information on emergency medical care facilities.

(4) Location.

(a) The information shall be displayed in a central location on the farm or in the nursery or greenhouse where it can be readily seen and read by handlers.

(b) The information shall be displayed in a location in or near the forest in a place where it can be readily seen and read by handlers and where handlers are likely to congregate or pass by, such as at a decontamination site or an equipment storage site.

(5) Accessibility. Handlers shall be informed of the location of the information and shall be allowed access to it.

(6) Legibility. The information shall remain legible during the time it is posted.

[Recodified as § 296-307-13040. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-13040, filed 9/30/96, effective 11/1/96.]

WAC 296-307-13045 Personal protective equipment—Standards for pesticide handlers—40 CFR, § 170.240. (1) Requirement. Any person who performs tasks as a pesticide handler shall use the clothing and personal protective equipment specified on the labeling for use of the product.

(2) Definition.

(a) Personal protective equipment (PPE) means devices and apparel that are worn to protect the body from contact with pesticides or pesticide residues, including, but not limited to, coveralls, chemical-resistant suits, chemical-resistant gloves, chemical-resistant footwear, respiratory protection devices, chemical-resistant aprons, chemical-resistant headgear, and protective eyewear.

(b) Long-sleeved shirts, short-sleeved shirts, long pants, short pants, shoes, socks, and other items of work clothing are not considered personal protective equipment for the purposes of this section and are not subject to the requirements of this section, although pesticide labeling may require that such work clothing be worn during some activities.

(3) Provision. When personal protective equipment is specified by the labeling of any pesticide for any handling activity, the handler employer shall provide the appropriate personal protective equipment in clean and operating condition to the handler.

(a) When "chemical-resistant" personal protective equipment is specified by the product labeling, it shall be made of material that allows no measurable movement of the pesticide being used through the material during use.

(b) When "waterproof" personal protective equipment is specified by the product labeling, it shall be made of material that allows no measurable movement of water or aqueous solutions through the material during use.

(c) When a "chemical-resistant suit" is specified by the product labeling, it shall be a loose-fitting, one-piece or two-piece chemical-resistant garment that covers, at a minimum, the entire body except head, hands, and feet.

(d) When "coveralls" are specified by the product labeling, they shall be a loose-fitting, one-piece or two-piece garment, such as a cotton or cotton and polyester coverall, that covers, at a minimum, the entire body except head, hands, and feet. The pesticide product labeling may specify that the coveralls be worn over another layer of clothing.

(e) Gloves shall be of the type specified by the product labeling. Gloves or glove linings made of leather, cotton, or other absorbent material shall not be worn for handling activities unless such materials are listed on the product labeling as acceptable for such use.

(f) When "chemical-resistant footwear" is specified by the product labeling, one of the following types of footwear must be worn:

(i) Chemical-resistant shoes.

(ii) Chemical-resistant boots.

(iii) Chemical-resistant shoe coverings worn over shoes or boots.

(g) When "protective eyewear" is specified by the product labeling, one of the following types of eyewear must be worn:

(i) Goggles.

(ii) Face shield.

(iii) Safety glasses with front, brow, and temple protection.

(iv) Full-face respirator.

(h) When a "chemical-resistant apron" is specified by the product labeling, an apron that covers the front of the body from mid-chest to the knees shall be worn.

(i) When a respirator is specified by the product labeling, it shall be appropriate for the pesticide product used and for the activity to be performed. The handler employer shall assure that the respirator fits correctly by using the procedures consistent with chapter 296-62 WAC, Part E. If the label does not specify the type of respirator to be used, it shall meet the requirements of chapter 296-62 WAC, Part E. The respiratory protection requirements of the general occupational health standards, chapter 296-62 WAC, Part E, shall apply.

(j) When "chemical-resistant headgear" is specified by the product labeling, it shall be either a chemical-resistant hood or a chemical-resistant hat with a wide brim.

(4) Exceptions to personal protective equipment specified on product labeling.

(a) Body protection.

(i) A chemical-resistant suit may be substituted for "coveralls," and any requirement for an additional layer of clothing beneath is waived.

(ii) A chemical-resistant suit may be substituted for "coveralls" and a chemical-resistant apron.

(b) Boots. If chemical-resistant footwear with sufficient durability and a tread appropriate for wear in rough terrain is not obtainable, then leather boots may be worn in such terrain.

(c) Gloves. If chemical-resistant gloves with sufficient durability and suppleness are not obtainable, then during handling activities with roses or other plants with sharp thorns, leather gloves may be worn over chemical-resistant glove liners. However, once leather gloves are worn for this use, thereafter they shall be worn only with chemical-resistant liners and they shall not be worn for any other use.

(d) Closed systems. If handling tasks are performed using properly functioning systems that enclose the pesticide to prevent it from contacting handlers or other persons, and if such systems are used and are maintained in accordance with that manufacturer's written operating instructions, exceptions to labeling-specified personal protective equipment for the handling activity are permitted as provided in (d)(i) and (ii) of this subsection.

(i) Persons using a closed system to mix or load pesticides with a signal word of DANGER or WARNING may substitute a long-sleeved shirt, long pants, shoes, socks, chemical-resistant apron, and any protective gloves specified on the labeling for handlers for the labeling-specified personal protective equipment.

(ii) Persons using a closed system to mix or load pesticides other than those in (d)(i) of this subsection or to perform other handling tasks may substitute a long-sleeved shirt, long pants, shoes, and socks for the labeling-specified personal protective equipment.

(iii) Persons using a closed system that operates under pressure shall wear protective eyewear.

(iv) Persons using a closed system shall have all labeling-specified personal protective equipment immediately available for use in an emergency.

(e) Enclosed cabs. If handling tasks are performed from inside a cab that has a nonporous barrier which totally surrounds the occupants of the cab and prevents contact with pesticides outside of the cab, exceptions to personal protective equipment specified on the product labeling for that handling activity are permitted as provided in (e)(i) through (iv) of this subsection.

(i) Persons occupying an enclosed cab may substitute a long-sleeved shirt, long pants, shoes, and socks for the labeling-specified personal protective equipment. If a respiratory protection device is specified on the pesticide product labeling for the handling activity, it must be worn.

(ii) Persons occupying an enclosed cab that has a properly functioning ventilation system which is used and maintained in accordance with the manufacturer's written operating instructions and which is declared in writing by the manufacturer and by the Washington state department of labor and industries to provide respiratory protection equivalent to or greater than a dust/mist filtering respirator may substitute a long-sleeved shirt, long pants, shoes, and socks for the labeling-specified personal protective equipment. If a respiratory protection device other than a dust/mist-filtering respirator is specified on the pesticide product labeling, it must be worn.

(iii) Persons occupying an enclosed cab that has a properly functioning ventilation system which is used and maintained in accordance with the manufacturer's written operating instructions and which is declared in writing by the manufacturer and by the Washington state department of labor and industries to provide respiratory protection equivalent to or greater than the vapor-removing or gas-removing respirator specified on pesticide product labeling may substitute a long-sleeved shirt, long pants, shoes, and socks for the labeling-specified personal protective equipment. If an air-supplying respirator or a self-contained breathing apparatus (SCBA) is specified on the pesticide product labeling, it must be worn.

(iv) Persons occupying an enclosed cab shall have all labeling-specified personal protective equipment immediately available and stored in a chemical-resistant container, such as a plastic bag. They shall wear such personal protective equipment if it is necessary to exit the cab and contact pesticide-treated surfaces in the treated area. Once personal protective equipment is worn in the treated area, it must be removed before reentering the cab.

(f) Aerial applications.

(i) Use of gloves. Chemical-resistant gloves shall be worn when entering or leaving an aircraft contaminated by pesticide residues. In the cockpit, the gloves shall be kept in an enclosed container to prevent contamination of the inside of the cockpit.

(ii) Open cockpit. Persons occupying an open cockpit shall use the personal protective equipment specified in the product labeling for use during application, except that chemical-resistant footwear need not be worn. A helmet may be substituted for chemical-resistant headgear. A visor may be substituted for protective eyewear.

(iii) Enclosed cockpit. Persons occupying an enclosed cockpit may substitute a long-sleeved shirt, long pants, shoes, and socks for labeling-specified personal protective equipment.

(g) Crop advisors. Crop advisors entering treated areas while a restricted-entry interval is in effect may wear the personal protective equipment specified on the pesticide labeling for early entry activities instead of the personal protective equipment specified on the pesticide labeling for handling activities, provided:

(i) Application has been completed for at least four hours.

(ii) Any inhalation exposure level listed in the labeling has been reached or any ventilation criteria established by WAC 296-307-12015 (3)(c) or in the labeling have been met.

(5) Use of personal protective equipment.

(a) The handler employer shall assure that personal protective equipment is used correctly for its intended purpose and is used according to the manufacturer's instructions.

(b) The handler employer shall assure that, before each day of use, all personal protective equipment is inspected for leaks, holes, tears, or worn places, and any damaged equipment is repaired or discarded.

(6) Cleaning and maintenance.

(a) The handler employer shall assure that all personal protective equipment is cleaned according to the manufacturer's instructions or pesticide product labeling instructions before each day of reuse. In the absence of any such instructions, it shall be washed thoroughly in detergent and hot water.

(b) If any personal protective equipment cannot be cleaned properly, the handler employer shall dispose of the personal protective equipment in accordance with any applicable federal, state, and local regulations. Coveralls or other absorbent materials that have been drenched or heavily contaminated with an undiluted pesticide that has the signal word DANGER or WARNING on the label shall be not be reused.

(c) The handler employer shall assure that contaminated personal protective equipment is kept separately and washed separately from any other clothing or laundry.

(d) The handler employer shall assure that all clean personal protective equipment shall be either dried thoroughly before being stored or shall be put in a well ventilated place to dry.

(e) The handler employer shall assure that all personal protective equipment is stored separately from personal clothing and apart from pesticide-contaminated areas.

(f) The handler employer shall assure that when dust/mist filtering respirators are used, the filters shall be replaced:

(i) When breathing resistance becomes excessive.

(ii) When the filter element has physical damage or tears.

(iii) According to manufacturer's recommendations or pesticide product labeling, whichever is more frequent.

(iv) In the absence of any other instructions or indications of service life, at the end of each day's work period.

(g) The handler employer shall assure that when gas-removing or vapor-removing respirators are used, the gas-removing or vapor-removing canisters or cartridges shall be replaced:

(i) At the first indication of odor, taste, or irritation.

(ii) According to manufacturer's recommendations or pesticide product labeling, whichever is more frequent.

(iii) In the absence of any other instructions or indications of service life, at the end of each day's work period.

(h) The handler employer shall inform any person who cleans or launders personal protective equipment:

(i) That such equipment may be contaminated with pesticides.

(ii) Of the potentially harmful effects of exposure to pesticides.

(iii) Of the correct way(s) to clean personal protective equipment and to protect themselves when handling such equipment.

(i) The handler employer shall assure that handlers have a clean place(s) away from pesticide storage and pesticide use areas where they may:

(i) Store personal clothing not in use.

(ii) Put on personal protective equipment at the start of any exposure period.

(iii) Remove personal protective equipment at the end of any exposure period.

(j) The handler employer shall not allow or direct any handler to wear home or to take home personal protective equipment contaminated with pesticides.

(7) Heat-related illness. When the use of personal protective equipment is specified by the labeling of any pesticide for the handling activity, the handler employer shall assure that no handler is allowed or directed to perform the handling activity unless appropriate measures are taken, if necessary, to prevent heat-related illness.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-13045, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-13045, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-20-082, § 296-306A-13045, filed 9/30/96, effective 11/1/96.]

WAC 296-307-13050 Decontamination—Standards for pesticide handlers—40 CFR, § 170.250. (1) Requirement. During any handling activity, the handler employer shall provide for handlers, in accordance with this section, decontamination supplies for washing off pesticides and pesticide residues.

(2) General conditions.

(a) The handler employer shall provide handlers with enough water for routine washing, for emergency eyeflushing, and for washing the entire body in case of an emergency. At all times when the water is available to handlers, the handler employer shall assure that it is of a quality and temperature that will not cause illness or injury when it contacts the skin or eyes or if it is swallowed. At least ten gallons of water for one employee and twenty gallons of water for two or more employees shall be provided at mixing and loading sites that do not have running water.

(b) When water stored in a tank is to be used for mixing pesticides, it shall not be used for decontamination or eye-flushing, unless the tank is equipped with properly functioning valves or other mechanisms that prevent movement of pesticides into the tank.

(c) The handler employer shall provide soap and single-use towels in quantities sufficient to meet handlers' needs.

(d) The handler employer shall provide one clean change of clothing, such as coveralls for use in an emergency.

(3) Location. The decontamination supplies shall be located together and reasonably accessible to and not more than one-quarter mile from each handler during the handling activity.

(a) Exception for mixing sites. For mixing activities, the decontamination supplies shall be at the mixing site.

(b) Exception for pilots. The decontamination supplies for a pilot who is applying pesticides aerially shall be in the airplane or at the aircraft loading site.

(c) Exception for handling pesticides in remote areas. When handling activities are performed more than one-quarter mile from the nearest place of vehicular access:

(i) The soap, single-use towels, clean change of clothing, and water may be at the nearest place of vehicular access.

(ii) The handler employer may permit handlers to use clean water from springs, streams, lakes, or other sources for decontamination at the remote work site, if such water is more accessible than the water with the decontamination supplies located at the nearest place of vehicular access.

(d) Decontamination supplies in treated areas. The decontamination supplies shall not be in an area being treated with pesticides or in an area under a restricted-entry interval, unless:

(i) The decontamination supplies are in the area where the handler is performing handling activities;

(ii) The soap, single-use towels, and clean change of clothing are in enclosed containers; and

(iii) The water is running tap water or is enclosed in a container.

(4) Emergency eyeflushing. To provide for emergency eyeflushing, the handler employer shall assure that at least one pint of water is immediately available to each handler who is performing tasks for which the pesticide labeling requires protective eyewear. The eyeflush water shall be carried by the handler, or shall be on the vehicle or aircraft the handler is using, or shall be otherwise immediately accessible.

(5) A plumbed or portable emergency eyewash capable of delivering at least 1.5 liters (0.4 gals.) of water per minute for fifteen minutes shall be provided at all pesticide mixing and loading stations or handler decontamination sites when the label requires protective eyewear for mixing, loading or applying. A plumbed or portable system meeting the above requirements shall be provided at all permanent pesticide mixing and loading sites.

(6) Decontamination after handling activities. At the end of any exposure period, the handler employer shall provide at the site where handlers remove personal protective equipment, soap, clean towels, and a sufficient amount of water so that the handlers may wash thoroughly. At least ten gallons of water for one employee and twenty gallons of water for two

or more employees shall be provided at mixing and loading sites that do not have running water.

[Recodified as § 296-307-13050. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-20-082, § 296-306A-13050, filed 9/30/96, effective 11/1/96.]

WAC 296-307-13055 Emergency assistance—Standards for pesticide handlers—40 CFR, § 170.260. If there is reason to believe that a person who is or has been employed by an agricultural establishment or commercial pesticide handling establishment to perform pesticide handling tasks has been poisoned or injured by exposure to pesticides as a result of that employment, including, but not limited to, exposures from handling tasks or from application, splash, spill, drift, or pesticide residues, the handler employer shall:

(1) Make available to that person prompt transportation from the place of employment or the handling site to an appropriate emergency medical facility.

(2) Provide to that person or to treating medical personnel, promptly upon request, any obtainable information on:

(a) Product name, EPA registration number, and active ingredients of any product to which that person might have been exposed.

(b) Antidote, first aid, and other medical information from the product labeling.

(c) The circumstances of handling of the pesticide.

(d) The circumstances of exposure of that person to the pesticide.

[Recodified as § 296-307-13055. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-082, § 296-306A-13055, filed 9/30/96, effective 11/1/96.]

Part J Pesticides Recordkeeping

WAC 296-307-145 Pesticides recordkeeping.

[Recodified as § 296-307-145. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-082, § 296-306A-145, filed 10/31/96, effective 12/1/96.]

WAC 296-307-14505 What records must an employer keep for pesticide applications? (1) If you apply pesticides, or have pesticides applied for you, related to the production of an agricultural crop, you must keep records for each application. The records must include the following:

(a) The address or exact location where the pesticide was applied or stored;

Note: If you apply pesticides to one acre or more, the location must be shown on the map on the required form for at least the first application.

(b) The year, month, day, and time the pesticide was applied or stored;

(c) The product name on the registered label and the United States Environmental Protection Agency registration number, if applicable, of the pesticide that was applied or stored;

(d) The crop or site to which the pesticide was applied (application crop or site);

(e) The amount of pesticide applied per acre, or other appropriate measure;

(f) The concentration of pesticide applied;

(g) The total area to which pesticide was applied;

(h) If applicable, the licensed applicator's name, address, and telephone number and the name of the individual(s) making the application;

(i) The direction and estimated velocity of the wind at the time the pesticide was applied;

Exception: Wind information does not have to be recorded for applications of baits in bait stations and pesticide applications within structures.

(j) Any other reasonable information required by the department.

(2) A commercial pesticide applicator must provide a copy of the pesticide application records to the owner or lessee of the lands to which the pesticide is applied. Pesticide application records may be provided on any form that includes all required information.

(3) You must update records on the same day that a pesticide is applied. You may use a copy as the record of the pesticide application. You must maintain the records for at least seven years after the date of the application.

(4) You must ensure that pesticide application records are readily accessible to employees and their designated representatives in a central location in the workplace. The records must be available beginning on the day the application is made and for at least thirty days after. You may view the pesticide application records and make your own record from that information.

(5) New or newly assigned employees must be made aware of the accessibility of the application records before working with pesticides or in an area containing pesticides.

(6) When storing pesticides, you must, at least once a year, perform an inventory of the pesticides stored in any work area.

(7) The pesticide inventory records must include the following information:

(a) The location where the pesticide is stored;

(b) The year, month, day, and time the pesticide was first stored;

(c) The product name used on the registered label and the United States Environmental Protection Agency Registration Number, if applicable, of the pesticide that is stored; and

(d) The amount of pesticide in storage at the time of the inventory.

(8) You must maintain a record of pesticide purchases made between the annual inventory dates.

(a) Instead of this purchase record, you may obtain from distributors from whom you buy pesticides, a statement obligating the distributor to maintain the purchase records on your behalf to meet the requirements of this section.

(b) We may require you to submit all purchase records covering the purchases during a specified period of time or in a specified geographical area.

(9) When you end all pesticide activities, you must file the records with us. Anyone who succeeds or replaces you must retain the records required by this section, but that person is not liable for any violations you commit.

(10) You must ensure that the records required under this section are readily accessible to us for inspection. You must also provide copies of the records on request, to:

(a) An employee or the employee's designated representative in the case of an industrial insurance claim filed under Title 51 RCW with the department of labor and industries;

(b) Treating health care personnel; or

(c) The pesticide incident reporting and tracking review panel.

(11) The designated representative or treating health care personnel are not required to identify the employee represented or treated.

(12) We will keep the name of any affected employee confidential according to RCW 49.17.080(1).

(13) When treating health care personnel request records under this section, and the record is required to determine treatment, you must provide copies of the record immediately. Information for treating health care personnel must be made immediately available by telephone, if requested, with a copy of the records provided within twenty-four hours. For all other requests, you must provide copies of the records within seventy-two hours.

(14) If requested, you must provide copies of records on a form provided by the department.

(15) If you suspect that an employee is ill or injured because of an exposure to one or more pesticides, you must immediately provide the employee with a copy of the relevant pesticide application records.

(16) If you refuse to provide a copy of a requested record, the requester may notify the department of the request and your refusal.

(a) Within seven working days, we will request that you provide us with all pertinent copies of the records, except that in a medical emergency we will request within two working days.

(b) You must provide copies of the records to us within twenty-four hours after we request.

(17) We inspect for the records required under this section as part of any on-site inspection of a workplace conducted under this chapter or chapter 49.17 RCW. We will determine, during the inspection, whether the records are readily transferable to a form adopted by the department, and readily accessible to employees. However, your records will not be inspected more than once in any calendar year, unless a previous inspection has found recordkeeping violations. If recordkeeping violations are found, we may conduct reasonable multiple inspections, according to department rules. (See WAC 296-27-16018, Compliance inspections, and WAC 296-27-16026, Programmed inspections.) Nothing in this section limits our inspection of records pertaining to pesticide-related injuries, illnesses, fatalities, accidents, or complaints.

(18) If you fail to maintain the records, or provide access to or copies of the records required under this section, you will be subject to penalties authorized under RCW 49.17.180.

(19) The department of labor and industries and the department of agriculture will jointly adopt by rule, forms that satisfy the information requirements of this section and RCW 17.21.100.

[Recodified as § 296-307-14505. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-14505, filed 10/31/96, effective 12/1/96.]

WAC 296-307-14510 What do the pesticides forms look like?

WAC 296-306A-14510 Pesticide application record (version 1).

State of Washington
Department of Agriculture
Olympia, Washington 98504

PESTICIDE APPLICATION RECORD (Version 1)

NOTE: This form must be completed same day as the application
and it must be retained for 7 years. (Ref. RCW 17.21)

- 1. Date of Application - Year: Month: Day: Time:
2. Name of person for whom the pesticide was applied: Firm Name (if applicable): Street Address: City: State: Zip:
3. Licensed Applicator's Name (if different from #2 above): License No.: Firm Name (if applicable): Tel. No.: Street Address: City: State: Zip:
4. Name of person(s) who applied the pesticide (if different than #3 above): License No(s). if applicable:
5. Application Crop or Site:
6. Total Area Treated (acre., sq. ft., etc):
7. Was this application made as a result of a WSDA Permit? No Yes (if yes, give Permit No.) #.....
8. Pesticide information (please list all information for each pesticide in the tank mix):

Table with 5 columns: a) Product Name, b) EPA Reg No., c) Total Amount of Pesticide Applied in Area Treated, d) Pesticide Applied/Acre (or other measure), e) Concentration Applied. Includes five rows of blank lines for data entry.

9. Address or exact location of application. NOTE: If the application is made to one acre or more of agricultural land, the field location must be shown on the map on page two of this form.

- 10. Wind direction and estimated velocity during the application:
11. Temperature during the application:
12. Apparatus license plate number (if applicable):
13. Air Ground Chemigation
14. Miscellaneous Information:

Location of Application (if the application covers more than one township or range, please indicate the township & range for the top left section of the map only):

Township:

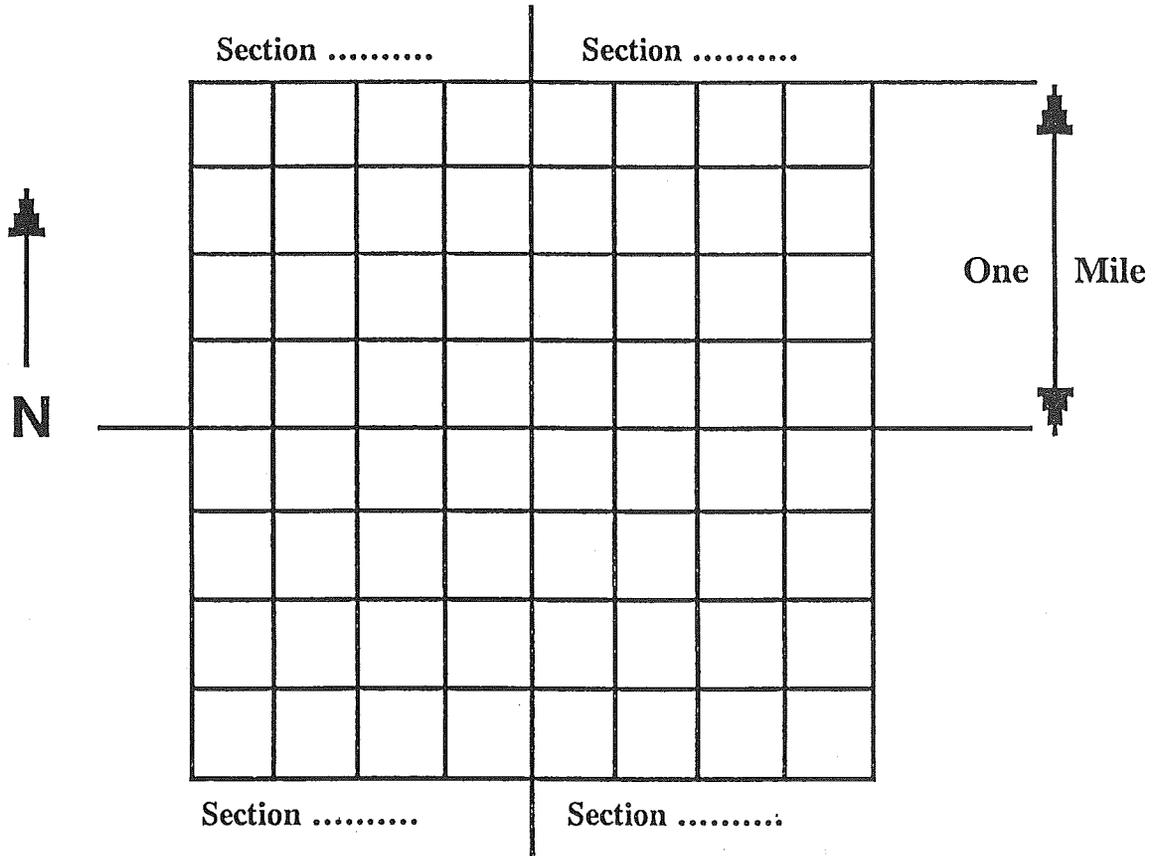
Range: E or W (please indicate)

Section(s):

County:

PLEASE NOTE:

The map is divided into 4 sections with each section divided into quarter-quarter sections. Please complete it by marking the appropriate section number(s) on the map and indicate as accurately as possible the location of the area treated.



Miscellaneous Information:

WAC 296-306A-14510 Pesticide application record (version 2).

State of Washington
Department of Agriculture
Olympia, Washington 98504

PESTICIDE APPLICATION RECORD (Version 2)

NOTE: Application information must be completed on the same day as the application and must be retained for seven years. (Ref. RCW 17.21)

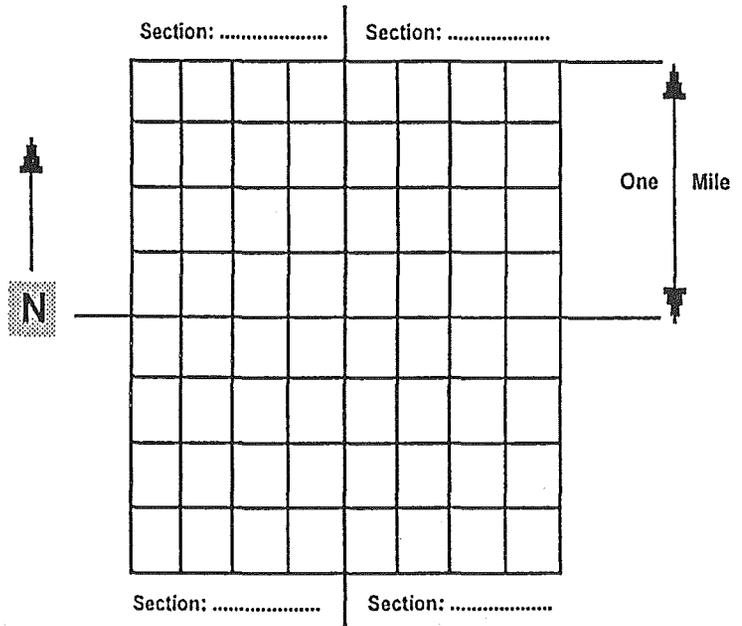
1. Name & Address of Person for Whom Pesticide was Applied: _____ _____ _____				2. Applicator Name and Address (if different from (1)): _____ _____ _____				
3. Address or exact location of application (NOTE: If the application is made to one acre or more of agricultural land, the field location must be shown on the map on page two of this form)				Tel. No. _____ Lic. No. _____				
4. Misc. Info.:								
5. Date and Time of Application	6. Crop or Site Treated <input type="checkbox"/> Air <input type="checkbox"/> Ground <input type="checkbox"/> Chemigation	7. Acres Treated (or other measure)	8. PRODUCT NAME	9. EPA Registration Number	10. Amount of Product Applied		11. Concentration	12. Weather Conditions, Apparatus License Plate No. and Name and License No. of person(s) who applied pesticide
					Rate per acre (or other measure)	Total Product Applied		

Location of Application: (If the application covers more than one township or range, please indicate the township & range for the top left section of the map only)

TOWNSHIP: _____ N
RANGE: _____ E or W
(please indicate)
SECTION(S): _____
COUNTY: _____

PLEASE NOTE:

The map is divided into 4 sections with each section divided into quarter-quarter sections. Please complete it by marking the appropriate section number(s) on the map and indicate as accurately as possible the location of the area treated.



WAC 296-307-14520 What are the department's recommendations for cholinesterase monitoring? (Nonmandatory) (1) We recommend that you implement a screening program for cholinesterase monitoring for employees handling organophosphate and carbamate pesticides.

(2) Red blood cell and plasma cholinesterase testing of employees who handle toxicity class 1 or 2 carbamate or organophosphate pesticides is an acceptable bioassay method for determining the extent and effects of exposure to these types of pesticides. The schedule of testing should include a preexposure baseline level, followed by periodic monitoring during the period of exposure.

(3) You should provide baseline cholinesterase tests for all employees handling carbamate or organophosphate pesticides for 30 hours or more in any 30-day period.

(4) Employees should be given baseline tests before actual exposure, at the beginning of the growing season, or upon first hire. These baseline tests should be repeated every two years.

(5) Periodic tests should be conducted every 30 days after the initial baseline for the next three months, and every 60 days thereafter until organophosphate or carbamate pesticide exposure ceases.

(6) You should not allow a monitored employee to be further exposed to carbamate or organophosphate pesticides if any cholinesterase test in comparison to the baseline is less than 70% of red blood cell baseline levels or 60% of plasma baseline levels. These employees should not be further exposed to organophosphate pesticides until their cholinesterase levels return to 80% or more of their baseline levels.

(7) Employees should be monitored for plasma or red blood cell cholinesterase levels.

(8) Monitoring programs should include appropriate follow-up and referrals to health care providers as needed, and should include a mechanism for recordkeeping and report tracking.

[Recodified as § 296-307-14520. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-14520, filed 10/31/96, effective 12/1/96.]

Part K Working Near Overhead Lines

WAC 296-307-150 Employees working near overhead lines.

[Recodified as § 296-307-150. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-150, filed 10/31/96, effective 12/1/96.]

WAC 296-307-15003 What does this section cover? WAC 296-307-150 does not apply to the construction, reconstruction, operation, or maintenance of overhead electrical conductors (and their supporting structures and associated equipment) by authorized and qualified electrical employees. It also does not apply to authorized and qualified employees engaged in the construction, reconstruction, operations and maintenance of overhead electrical circuits or conductors (and their supporting structures and associated equipment) of rail transportation systems, or electrical generating, transmission, distribution, and communication systems.

[Title 296 WAC—p. 2534]

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-15003, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-15003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-15003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-15006 What clearance and safeguards are required to protect employees working near overhead lines? (1) All exposed overhead conductors must be isolated from accidental contact by employees or equipment.

(2) Irrigation pipe must not be stored within one hundred feet of overhead conductors.

(3) Upending irrigation pipe within one hundred feet of overhead conductors is prohibited.

(4) Water and irrigation systems, and other devices that discharge a conductive liquid, must be set up and operated so that the discharge from the system is directed more than ten feet away from overhead high-voltage lines, and avoids contact with any exposed electrical power conductor.

(5) Employees are prohibited from entering or working in proximity to high-voltage lines, unless there are guards to prevent accidental contact.

Note: Voltage 600V and higher is considered high voltage.

(6) The following are prohibited if it is possible to bring these objects within ten feet of high-voltage lines:

(a) Operating, erecting, or transporting tools, equipment, or a moving part;

(b) Handling, transporting, or storing materials; or

(c) Moving a building near high-voltage lines.

(7) Equipment or machines must be operated near power lines according to the following:

(a) For lines rated 50 kv. or below, minimum clearance between the lines and any part of the object must be ten feet;

(b) For lines rated over 50 kv. minimum clearance between the lines and any part of the object must be ten feet plus four tenths of an inch for each 1 kv., over 50 kv., or twice the length of the line insulator but never less than ten feet;

(c) In transit, the clearance must be a minimum of four feet for voltages less than 50 kv., ten feet for voltages over 50 kv. up to and including 345 kv., and sixteen feet for voltages up to and including 750 kv.;

(d) You must designate someone to observe clearance and give warning for operations where it is difficult for the operator to see well enough to maintain the necessary clearance.

Exception: You are exempt from this requirement if electrical distribution and transmission lines have been deenergized and visibly grounded at point of work; or if insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines.

[Recodified as § 296-307-15006. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-15006, filed 10/31/96, effective 12/1/96.]

WAC 296-307-15009 What signs must an employer post to warn employees working near overhead lines? You must post and maintain in plain view of the operator on each derrick, power-shovel, drilling-rig, hay loader, hay stacker, or similar apparatus with parts that are capable of vertical, lateral or swinging motion, a durable warning sign legible at twelve feet that says, "unlawful to operate this equipment within ten feet of high-voltage lines."

(1999 Ed.)

[Recodified as § 296-307-15009, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-15009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-15012 When must an employer notify the utility of employees working near overhead lines? The employer must notify the operator of high-voltage lines when any operations are to be performed, tools or materials handled, or equipment is to be moved or operated within ten feet of any high-voltage line. All required safety measures must be completed before proceeding with any work that would reduce the clearance requirements of this section.

[Recodified as § 296-307-15012, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-15012, filed 10/31/96, effective 12/1/96.]

Part L Temporary Labor Camps

WAC 296-307-160 Temporary labor camps.

[Recodified as § 296-307-160, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-160, filed 10/31/96, effective 12/1/96.]

WAC 296-307-16001 What requirements apply to camp sites? (1) You must ensure that all sites used for temporary labor camps are adequately drained. The site must be free from periodic flooding, and located at least 200 feet from a swamp, pool, sink hole, or other surface collection of water unless the water surface can be subject to mosquito control. Drainage from and through the camp must not endanger any domestic or public water supply. All sites must be free from depressions in which water may become a nuisance.

(2) All sites must be large enough to prevent overcrowding of necessary structures. The principal camp area for sleeping and for food preparation and eating must be at least 500 feet from where livestock are kept.

(3) The grounds and open areas surrounding the shelters must be maintained in a clean and sanitary condition.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-16001, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-16001, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-16001, filed 10/31/96, effective 12/1/96.]

WAC 296-307-16003 How must camp shelters be constructed? (1) You must ensure that every shelter in the camp is constructed to provide protection against the elements.

(2) Each room used for sleeping purposes must have at least 50 square feet of floor space for each occupant. The room must have at least a 7-foot ceiling.

(3) You must provide beds, cots, or bunks, and suitable storage facilities such as wall lockers for clothing and personal articles in every sleeping room.

(a) Beds must be at least 36 inches apart, both laterally and end to end, and the frame must keep mattresses at least 12 inches off the floor.

(b) Double-deck bunks must be spaced at least 48 inches apart, both laterally and end to end.

(c) The minimum clear space between lower and upper bunks must be at least 27 inches.

(1999 Ed.)

(d) Triple-deck bunks are prohibited.

(4) The floors of each shelter must be constructed of wood, asphalt, or concrete. Wooden floors must be smooth and tight. The floors must be kept in good repair.

(5) All wooden floors must be elevated at least 1 foot above ground level at all points to prevent dampness and to permit free air circulation.

(6) You may "bank" around outside walls with earth or other suitable material to guard against extreme low temperatures.

(7) All living quarters must have windows covering a total area equal to at least one-tenth of the floor area. You must ensure that at least one-half of each window can be opened for ventilation.

(8) All exterior openings must be screened with 16-mesh material. All screen doors must have self-closing devices.

(9) You must ensure that each dwelling unit has at least 70 square feet of floor space for the first occupant and at least 50 square feet of floor space for each additional occupant. In a family unit, the husband and wife must have a separate sleeping area whenever living with one or more children over six years old.

(10) If a camp is used during cold weather, you must provide adequate heating equipment.

Note: All heating, cooking, and water heating equipment must be installed according to state and local ordinances, codes, and regulations governing such installations.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-16003, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-16003, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 97-08-051A, § 296-306A-16003, filed 3/31/97, effective 5/1/97; 96-22-048, § 296-306A-16003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-16004 What electricity must be provided for temporary labor camps? (1) A labor camp operator must supply electricity to all dwelling units, kitchen facilities, shower/bathroom facilities, common areas, and laundry facilities.

(2) All electrical wiring and electrical equipment in labor camps must meet the electric standards of applicable building codes.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-16004, filed 12/1/98, effective 3/1/99.]

WAC 296-307-16005 What requirements apply to the water supply? (1) In each camp, you must provide an adequate and convenient water supply for drinking, cooking, bathing, and laundry purposes. The water supply must be approved by the appropriate health authority.

"Adequate water supply" means a water supply that is capable of delivering 35 gallons per person per day to the campsite at a peak rate of 2 1/2 times the average hourly demand.

(2) You must ensure that the distribution lines are able to supply water at normal operating pressures to all fixtures for simultaneous operation. If water is not piped to the shelters, water outlets must be distributed throughout the camp so that no shelter is more than 100 feet from a yard hydrant.

(3) Where water under pressure is available, you must provide one or more drinking fountains for each 100 occupants or fraction thereof. The construction of drinking foun-

tains must comply with ANSI Standard Specifications for Drinking Fountains, Z4.2-1942. Common drinking cups are prohibited.

[Recodified as § 296-307-16005. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-16005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-16007 Must an employer provide toilet facilities for the camp? (1) You must provide toilet facilities adequate for the camp capacity.

(2) You must ensure that no one has to pass through a sleeping room to reach a toilet room. Toilet rooms must either have a window of at least 6 square feet opening directly to the outside, or be satisfactorily ventilated. All outside openings must be screened with 16-mesh material. No fixture, water closet, chemical toilet, or urinal must be located in a room used for other than toilet purposes.

(3) A toilet room must be within 200 feet of the door of each sleeping room. An outhouse must be at least 100 feet away from any sleeping room, dining room, lunch area, or kitchen.

(4) Where toilet rooms are shared, such as in multifamily shelters and in barracks type facilities, you must provide separate toilet rooms for each sex. These rooms must be distinctly marked "men" and "women" by signs printed in English and in the native language of the persons occupying the camp, or marked with easily understood pictures or symbols. If the facilities for each sex are in the same building, they must be separated by solid walls or partitions extending from the floor to the roof or ceiling.

(5) Where toilet facilities are shared, you must provide water closets or outhouses for each sex, based on the maximum number of persons of that sex that the camp is designed to house at any one time. Water closets or outhouses must be provided in the ratio of one unit for each 15 persons, and a minimum of two units for any shared facility.

(6) You must provide one urinal or 2 linear feet of urinal trough for each 25 men. The floor from the wall and out at least 15 inches from the outer edge of the urinals must be constructed of materials impervious to moisture. Where water under pressure is available, urinals must have an adequate water flush. Urinal troughs in outhouses must drain freely into the pit or vault and the drain must be constructed to exclude flies and rodents from the pit.

(7) Every water closet installed after the effective date of these standards must be located in a toilet room.

(8) Each outhouse, water closet, or chemical toilet compartment must have an adequate supply of toilet paper.

(9) Toilet rooms must be kept in a sanitary condition and be cleaned at least daily.

[Recodified as § 296-307-16007. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-16007, filed 10/31/96, effective 12/1/96.]

WAC 296-307-16009 Must sewer lines connect to public sewers? All sewer lines and floor drains from buildings must be connected to public sewers when sewers are available.

[Recodified as § 296-307-16009. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-16009, filed 10/31/96, effective 12/1/96.]

[Title 296 WAC—p. 2536]

WAC 296-307-16011 What facilities must an employer provide for laundry, handwashing, and bathing? (1) Laundry, handwashing, and bathing facilities must be provided in the following ratio:

(a) One handwash basin per family shelter or per six persons in shared facilities.

(b) One shower head for every 10 persons.

(c) One laundry tray or tub for every 30 persons.

(d) One "deepwell" type sink in each building used for laundry, hand washing, and bathing.

(2) Floors must be moisture resistant and smooth but not slippery. All junctions of the curbing and the floor must be coved. The walls and partitions of shower rooms must be smooth and moisture resistant to the height of splash. All shower baths, shower rooms, or laundry rooms must have floor drains to remove waste water and facilitate cleaning.

(3) An adequate supply of hot and cold running water must be provided for bathing and laundry purposes. Facilities for heating water must be provided.

(4) Every service building must be provided with equipment capable of maintaining a temperature of at least 70°F.

(5) Facilities for drying clothes must be provided.

(6) All service buildings must be kept clean.

[Recodified as § 296-307-16011. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-16011, filed 10/31/96, effective 12/1/96.]

WAC 296-307-16013 What lighting must an employer provide in camp buildings? Each habitable room in a camp must have at least one ceiling-type light fixture and at least one separate floor-type or wall-type convenience outlet. Laundry and toilet rooms and rooms where people congregate must have at least one ceiling-type or wall-type fixture. Light levels in toilet and storage rooms must be at least 20 foot-candles 30 inches from the floor. The light level in other rooms, including kitchens and living quarters, must be at least 30 foot-candles 30 inches from the floor.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-16013, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-16013. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 97-08-051A, § 296-306A-16013, filed 3/31/97, effective 5/1/97; 96-22-048, § 296-306A-16013, filed 10/31/96, effective 12/1/96.]

WAC 296-307-16015 What requirements apply to refuse disposal? (1) Cleanable or single service containers that can be securely closed, approved by the state board of health, must be provided for garbage storage. At least one such container must be provided for each family shelter and must be located within 100 feet of each shelter on a wooden, metal, or concrete pad.

(2) Garbage containers must be kept clean.

(3) Garbage containers must be emptied when full, and at least twice a week.

[Recodified as § 296-307-16015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-16015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-16017 What cooking and food-handling facilities must be provided in temporary labor camps? A labor camp operator must provide enclosed and

screened cooking and food-handling facilities for all occupants.

(1) If cooking facilities are located in dwelling units, the operator must provide:

(a) An operable cook stove or hot plate with at least one cooking surface for every two occupants;

(b) A sink with hot and cold running potable water under pressure;

(c) Food storage areas and nonabsorbent, easily cleanable food preparation counters situated off the floor;

(d) Mechanical refrigeration able to maintain a temperature of forty-five degrees Fahrenheit or below, with enough space to store perishable food items for all occupants;

(e) Fire-resistant, nonabsorbent, nonasbestos, and easily cleanable wall coverings adjacent to cooking areas;

(f) Nonabsorbent, easily cleanable floors;

(g) At least one ceiling or wall light fixture; and

(h) Lighting of thirty foot-candles measured thirty inches from the floor; and

(i) Adequate ventilation for cooking facilities.

(2) In common food-handling facilities, the operator must provide:

(a) A room or building, adequate in size, separate from any sleeping quarters;

(b) No direct openings to living or sleeping areas from the common food-handling facility;

(c) An operable cook stove or hot plate with at least one cooking surface for every two occupants;

(d) Sinks with hot and cold running potable water under pressure;

(e) Food storage areas and nonabsorbent, easily cleanable food preparation counters situated off the floor;

(f) Mechanical refrigeration able to maintain a temperature of forty-five degrees Fahrenheit or below, with enough space to store perishable food items for all occupants;

(g) Fire-resistant, nonabsorbent, nonasbestos, and easily cleanable wall coverings adjacent to cooking areas;

(h) Nonabsorbent, easily cleanable floors;

(i) At least one ceiling or wall light fixture; and

(j) Lighting of thirty foot-candles measured thirty inches from the floor;

(k) Adequate ventilation for cooking facilities.

(3) The operator must ensure that dining hall facilities:

(a) Comply with chapter 246-215 WAC, Food service;

(b) Are in a room or building, adequate in size, separate from any sleeping quarters;

(c) Have no direct openings to living or sleeping areas from the dining hall facility;

(d) Have fire-resistant, nonabsorbent, nonasbestos, and easily cleanable wall coverings adjacent to cooking areas;

(e) Have nonabsorbent, easily cleanable floors;

(f) Have at least one ceiling or wall light fixture; and

(g) Have available lighting of thirty foot-candles measured thirty inches from the floor.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-16017, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-16017, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-16017, filed 10/31/96, effective 12/1/96.]

(1999 Ed.)

WAC 296-307-16019 Must an employer provide insect and rodent control? You must take effective measures to prevent and control insect and rodent infestation.

[Recodified as § 296-307-16019, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-16019, filed 10/31/96, effective 12/1/96.]

WAC 296-307-16021 What first-aid facilities must be available in the camp? (1) In every camp, you must provide and maintain adequate first-aid facilities, approved by a health authority, for emergency treatment.

(2) A first-aid trained person must be in charge of first-aid facilities.

[Recodified as § 296-307-16021, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-16021, filed 10/31/96, effective 12/1/96.]

WAC 296-307-16023 When must an employer report communicable diseases in a camp? (1) You must report immediately to the local health officer the name and address of any individual in the camp known to have or suspected of having a communicable disease.

(2) Whenever suspected food poisoning or an unusual prevalence of fever, diarrhea, sore throat, vomiting, or jaundice occurs, the camp superintendent must report immediately the outbreak to the local health officer or state board of health.

[Recodified as § 296-307-16023, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-16023, filed 10/31/96, effective 12/1/96.]

WAC 296-307-18005 How must fan blades be guarded? You must guard the blades of a fan located less than seven feet above the floor or working level. The guard must have maximum openings of one-half inch.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18005, filed 12/1/98, effective 3/1/99.]

WAC 296-307-18010 How must constant-running drives be guarded? Shields, guards, and access doors that will prevent accidental contact with rotating machine parts on constant-running drives must be in place when the machine is running.

EXCEPTION: This requirement does not apply to combines when guards could create fire hazards.

"Constant-running drives" means drives that continue to rotate when the engine is running and all clutches are disengaged.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18010, filed 12/1/98, effective 3/1/99.]

WAC 296-307-18015 What training must an employer provide for employees who use agricultural equipment? At the time of initial assignment and at least annually thereafter, you must instruct every employee in the safe operation and servicing of all equipment that the employee will use, including at least the following:

(1) Keep all guards in place when the machine is in operation.

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(2) Only persons required for instruction or machine operation may ride on equipment, unless a passenger seat or other protective device is provided.

(3) Stop engine, disconnect the power source, and wait for all machine movement to stop before servicing, adjusting, cleaning, or unclogging the equipment.

EXCEPTION: When the machine must be running to be properly serviced or maintained, you must instruct employees in the steps and procedures necessary to safely service or maintain the equipment.

(4) Make sure everyone is clear of machinery before starting the engine, engaging power, or operating the machine.

(5) Lock out electrical power before performing maintenance or service on farmstead equipment.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18015, filed 12/1/98, effective 3/1/99.]

WAC 296-307-18020 What requirements apply to machine controls? (1) If machine operation requires the presence of an operator on the machine, a "stop button" must be provided on the machine within reach of the operator.

(2) Power control devices must be marked to indicate the function and machine they control. "On" and "off" must be marked.

(3) "Stop" buttons must be red or orange. Each machine must have one or more stop buttons according to the working position of the operators.

(4) Power control devices must be located or guarded to prevent unexpected or accidental movement of the control. "Start" buttons must be recessed.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18020, filed 12/1/98, effective 3/1/99.]

WAC 296-307-18025 How must steam pipes be guarded? (1) All steam pipes or pipes hot enough to burn a person (other than coil pipes, radiators for heating rooms or buildings, or pipes on portable steam engines and boilers) must be guarded with a standard safeguard, unless guarded by location.

(2) All exposed hot pipes within seven feet of the floor or working platform, or within fifteen inches measured horizontally from stairways, ramps, or fixed ladders, must be covered with insulating material or be guarded to prevent contact.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18025, filed 12/1/98, effective 3/1/99.]

INDOOR OPERATIONS

Part M

Guarding Tools and Equipment; Farm Shops; Materials Handling

WAC 296-307-185 Guarding powered saws.

[Recodified as § 296-307-185, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-185, filed 10/31/96, effective 12/1/96.]

WAC 296-307-18503 What general requirements apply to powered saws? (1) You must ensure that all

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cracked saw blades are removed from service, except as indicated in WAC 296-307-18515(6).

(2) Inserting a wedge between a saw disk and its collar to form a "wobble saw" for rabbeting or dadoing is prohibited.

EXCEPTION: This does not apply to properly designed adjustable rabbeting blades.

(3) You must provide and ensure that employees use push sticks or push blocks in sizes and types suitable for the work to be done.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18503, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-18503, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-18503, filed 10/31/96, effective 12/1/96.]

WAC 296-307-18506 How must band saws be guarded? (1) You must ensure that all band wheels are completely encased or guarded on both sides. Guards must be constructed of at least No. 14 U.S. gauge metal, nominal two-inch wood material, or mesh or perforated metal of at least U.S. gauge No. 20 with maximum openings of three-eighths inch.

(2) You must ensure that all nonworking portions of the band saw blade are enclosed or guarded. The working side of the blade between the guide and the table may be left open to work on the stock.

(3) You must ensure that the guard for the portion of the blade between the sliding guide and the upper-saw-wheel guard protects the saw blade at the front and outer side.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18506, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-18506, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-18506, filed 10/31/96, effective 12/1/96.]

WAC 296-307-18509 How must radial arm saws be guarded? (1) You must ensure that the upper hood completely encloses the upper portion of the blade, including the end of the saw arbor. The upper hood must be constructed to protect the operator from flying material, and to deflect sawdust. The sides of the lower exposed portion of the blade must be guarded to the full diameter of the blade by a device that will automatically adjust itself to the thickness of the stock and remain in contact with stock. You may use an alternative lower blade guard if it provides equivalent protection.

(2) You must provide an adjustable stop to prevent the forward travel of the blade beyond the position necessary to complete the cut.

(3) You must equip a radial arm-saw with a mechanism to return the saw and keep it in position at the back of the table or behind the rip fence.

For example: You may use a counter-weight or a saw retractor device, or tilt the front of the radial arm saw unit up enough to maintain the blade at the back of the table or behind the rip fence when the pull handle is released by the operator.

(4) You must ensure that ripping and ploughing are permitted only against the direction in which the saw turns. Mark the direction of the saw rotation on the hood, and attach a permanent warning sign to the rear of the guard that prohibits ripping or ploughing from that position. (Where the blade

teeth exit the upper hood when set up for ripping would be the rear of the saw in this case.) Each radial arm saw used for ripping must be provided with antikickback fingers or dogs to prevent the saw from throwing the material or stock back at the operator.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18509, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-18509, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-18509, filed 10/31/96, effective 12/1/96.]

WAC 296-307-18512 How must table saws be guarded? (1) You must ensure that each circular blade table saw used for ripping or crosscutting is guarded by a standard hood that covers the saw blade above the material completely at all times during the cut. The hood must adjust itself automatically to the thickness of, and must remain in contact with, the material being cut.

EXCEPTION: When finished surfaces of stock may be marred by the guard, it may be raised slightly to avoid contact. The hood must be designed to protect the operator from flying material.

(2) You must ensure that any table saw used for ripping has antikickback fingers or dogs and a spreader.

(3) While used for rabbeting, ploughing, grooving or dadoing a table saw may be used without an antikickback device and a spreader. Upon completion, the antikickback device and spreader must be replaced immediately.

(4) You must ensure that the part of the table saw that is beneath the table is fully guarded to prevent employee contact with the portion of the blade below the table.

(5) Power transmission components of table saws must be guarded according to WAC 296-307-280.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18512, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-18512, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-18512, filed 10/31/96, effective 12/1/96.]

WAC 296-307-18515 How must circular fuel-wood saws be guarded? (1) You must ensure that fuel-wood saws are guarded by a standard guard that completely encloses the blade to the depth of the teeth, except for the area where material is fed into the blade.

(2) You must ensure that the tables of fuel-wood saws is constructed so that material being sawed is supported on both sides of the blade.

(3) You must provide a mechanism that will prevent the leading edge of the saw from passing the front edge of the table or roll case.

(4) You must provide tilting tables of fuel-wood saws with a backrest for the full length of the table. The backrest must extend upward from the table platform at least to the height of the saw opening. An opening in a backrest must be a maximum of two inches. The backrest frame and filler must be constructed of material strong and rigid enough to prevent distortion under normal use.

(5) Power transmission components of fuel-wood saws must be guarded according to WAC 296-307-280.

(1999 Ed.)

(6) When a circular fuel-wood saw blade develops a crack, you must discontinue its use until properly repaired, according to the following measurements.

Length of crack	Diameter of saw in inches
1/2"	12"
1"	24"
1-1/2"	36"

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-18515, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-18515, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-18515, filed 10/31/96, effective 12/1/96.]

WAC 296-307-190 Guarding bench grinders, abrasive wheels, and portable grinders.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-190, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-190, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-190, filed 10/31/96, effective 12/1/96.]

WAC 296-307-19003 What definitions apply to this section? "Abrasive wheel" means a cutting tool consisting of abrasive grains held together by organic or inorganic bonds. This includes diamond and reinforced wheels.

"Flanges" means collars, discs, or plates between which wheels are mounted. Also referred to as adapter, sleeve, or back.

"Mounted wheels" means wheels of various dimensions that are usually 2 inches in diameter or smaller. They can be either organic or inorganic bonded abrasive wheels. They are secured to plain or threaded steel mandrels.

"Off-hand grinding" means grinding material or a part that is held in the operator's hand.

"Portable grinding" means the grinding machine is hand-held and may be easily moved from one location to another.

"Reinforced wheels" means a class of organic wheels that contain strengthening fabric or filament. "Reinforced" does not mean wheels using such mechanical additions as steel rings, steel cup backs, or wire or tape winding.

"Safety guard" means an enclosure designed to restrain the pieces of the grinding wheel and protect the operator in the event that the wheel is broken in operation.

[Recodified as § 296-307-19003, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-19003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-19006 What rules apply to guarding abrasive wheels? (1) Abrasive wheels must be used only on machines provided with safety guards.

EXCEPTION: This requirement does not apply to the following:
 (a) Wheels used for internal work while the wheel is within the work being ground.
 (b) Mounted wheels 2 inches and smaller in diameter, used in portable operations.
 (c) Types 16, 17, 18, 18R, and 19 cones, plugs, and threaded hole pot balls where the work offers protection.
 (d) Specially shaped "sickle grinding" wheels mounted in mandrel-type bench or floor stands.

(2) The safety guard must cover the spindle end, nut, and flange projections.

EXCEPTIONS:

- (a) When the work provides protection to the operator, the spindle end, nut, and outer flange may be exposed. When the work entirely covers the side of the wheel, the side covers of the guard may be omitted.
- (b) The spindle end, nut, and outer flange may be exposed on portable machines designed for, and used with, type 6, 11, 27, and 28 abrasive wheels, cutting off wheels, and tuck pointing wheels.
- (c) The spindle end, nut, and outer flange may be exposed on machines designed as portable saws.

(3) The guard must cover the sides and periphery of the wheel.

EXCEPTIONS:

- (a) Bench and floor stands;
- (i) The maximum permissible angle of exposure is 90°. This exposure must begin at a point not more than 65° above the horizontal plane of the wheel spindle.
- (ii) Wherever the nature of the work requires contact with the wheel below the horizontal plane of the spindle, the exposure must not exceed 125°. This exposure must begin at a point not more than 65° above the horizontal plane of the wheel spindle.
- (b) Swing-frame grinders may only be exposed on the bottom half; the top half of the wheel must be enclosed at all times.
- (c) Where the work is applied to the top of the wheel, the exposure of the grinding wheel periphery must not exceed 60°.
- (d) When the work entirely covers the side of the wheel, the side covers of the guard may be omitted.

(4) The safety guard must be mounted to maintain proper alignment with the wheel, and the strength of the fastenings must exceed the strength of the guard.

(5) Take care to see that the safety guard is properly positioned before starting the mounted wheel.

(6) Abrasive wheel machinery guards must meet the design specifications of ANSI B7.1-1970.

(7) Exception: WAC 296-307-19006 does not apply to natural sandstone wheels and metal, wooden, cloth, or paper discs, with a layer of abrasive on the surface.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-19006, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-19006, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-19006, filed 10/31/96, effective 12/1/96.]

WAC 296-307-19009 What are the use, mounting, and guarding rules for abrasive wheels? (1) Immediately before mounting, the operator must closely inspect and sound (ring test) all wheels to make sure they are not damaged. Before mounting the wheel, the operator must check the spindle speed of the machine to be certain that it does not exceed the maximum operating speed marked on the wheel.

"Ring test" means to tap the wheel gently with a light nonmetallic implement, such as the handle of a screwdriver for light wheels, or a wooden mallet for heavier wheels.

(2) Grinding wheels must fit freely on the spindle and remain free under all grinding conditions. The wheel hole must be made suitably oversized to ensure that heat and pressure do not create a hazard.

(3) All contact surfaces of wheels, blotters, and flanges must be flat and free of foreign matter.

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(4) Bushings used in the wheel hole must not exceed the width of the wheel and must not contact the flanges.

(5) On offhand grinding machines, work rests must be used to support the work. The work rest must be rigid and adjustable to compensate for wheel wear. Work rests must be kept adjusted closely to the wheel with a maximum opening of one-eighth inch to prevent the work from jamming between the wheel and the rest. The work rest must be securely clamped after each adjustment and shall not be adjusted with the wheel in motion.

(6) Goggles or face shields must be used when grinding.

(7) Nonportable grinding machines must be securely mounted on substantial floors, benches, foundations, or other adequate structures.

(8) After mounting, abrasive wheels must be run at operating speed with the safety guard in place and properly adjusted, or in a protected enclosure for at least one minute before applying work. During this time, no one may stand in front of or in line with the wheel.

(9) Grinders or abrasive wheels that vibrate or are out of balance must be repaired before use.

(10) Abrasive wheels not designed for the machine or guard must not be mounted on a grinder.

(11) Side grinding must only be performed with wheels designed for this purpose.

Note: Light grinding on the side of straight wheels is permitted only when very delicate pressure is applied.

(12) Where the operator may stand in front of the opening, safety guards must be adjustable to compensate for wheel wear. The distance between the wheel periphery and the adjustable tongue or the guard above the wheel must not exceed one-quarter inch.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-19009, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-19009, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-19009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-19012 What requirements apply to flanges? (1) Grinding machines must have flanges.

(2) All abrasive wheels must be mounted between flanges that are at least one-third the diameter of the wheel. Regardless of flange type used, the wheel must always be guarded. Blotters must be used according to this section.

(3) Design and material requirements include:

(a) Flanges must be designed to transmit the driving torque from the spindle to the grinding wheel.

(b) Flanges must be made of steel, cast iron, or other material of equal or greater strength and rigidity.

(4) An abrasive wheel that is designed to be held by flanges must not be operated without them. Except for those types requiring flanges of a special design, flanges must be at least one-third the diameter of the wheel.

(5) Facings of compressible material (blotters) must be inserted between the abrasive wheel and flanges to ensure uniform distribution of flange pressure.

(6) All flanges must be maintained in good condition. When the bearing surfaces become damaged, they should be trued or refaced. When refacing or truing, exercise care to make sure that proper relief and rigidity is maintained before starting the wheel.

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[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-19012, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-19012, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-19012, filed 10/31/96, effective 12/1/96.]

WAC 296-307-19015 How must vertical portable grinders be guarded? Safety guards on right angle head or vertical portable grinders must have a maximum exposure angle of 180°, and the guard must be between the operator and the wheel during use. The guard must be adjusted so that pieces of an accidentally broken wheel will be deflected away from the operator.

[Recodified as § 296-307-19015, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-19015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-19018 How must other portable grinders be guarded? Other portable grinding machines must be guarded so that only the bottom half of the wheel is exposed. The top half of the wheel must be enclosed at all times.

[Recodified as § 296-307-19018, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-19018, filed 10/31/96, effective 12/1/96.]

WAC 296-307-195 What rules apply to grounding and "dead man" controls for hand-held portable power tools? (1) Each hand-held, power-driven tool must have a "dead man" control, such as a spring-actuated switch, valve, or equivalent device, so that the power will be automatically shut off whenever the operator releases the control.

(2) The frames and all exposed, noncurrent-carrying metal parts of portable electric machinery, operated at more than fifty volts to ground, must be grounded. Other hand-held portable motors driving electric tools must be grounded if they operate at more than fifty volts to ground. The ground must use a separate ground wire and polarized plug and receptacle.

Exception: Double insulated tools that are designed and used according to the requirements of Article 250-45 of the National Electrical Code (1971 edition) are exempt from the grounding requirements.

[Recodified as § 296-307-195, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-195, filed 10/31/96, effective 12/1/96.]

WAC 296-307-200 Compressed air.

[Recodified as § 296-307-200, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-200, filed 10/31/96, effective 12/1/96.]

WAC 296-307-20005 May compressed air be used for cleaning? Using compressed air for cleaning purposes is prohibited, except where the pressure is reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

[Recodified as § 296-307-20005, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-20005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-20010 What requirements apply to compressed air tools? (1) When using compressed air tools, use care to prevent the tool from being shot from the gun.

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(2) When momentarily out of use, the gun should be laid so that the tool cannot fly out if the pressure is accidentally released. When not in use, all tools should be removed from the gun.

(3) When disconnecting a compressed air tool from the air line, first shut off the pressure and then operate the tool to release the pressure remaining in the hose.

(4) Compressed air hose or guns must not be pointed at or brought into contact with the body of any person.

[Recodified as § 296-307-20010, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-20010, filed 10/31/96, effective 12/1/96.]

WAC 296-307-205 Guarding portable powered tools.

[Recodified as § 296-307-205, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-205, filed 10/31/96, effective 12/1/96.]

WAC 296-307-20505 What requirements apply to guarding portable powered tools? (1) All portable, power-driven circular saws with a blade diameter greater than 2 inches must have guards above and below the base plate or shoe.

(a) The upper guard must cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts.

(b) The lower guard must cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work.

(c) When the tool is withdrawn from the work, the lower guard must automatically and instantly return to covering position.

(2) Portable belt sanding machines must have guards at each nip point where the sanding belt runs onto a pulley. These guards must prevent the hands or fingers of the operator from coming in contact with the nip points. The unused run of the sanding belt must be guarded against accidental contact.

(3) Portable electric powered tools must meet the electrical requirements of chapter 296-307 WAC Part T.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-20505, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-20505, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-20505, filed 10/31/96, effective 12/1/96.]

WAC 296-307-20510 What requirements apply to switches and controls on portable powered tools? (1) The following powered tools must have a constant pressure switch or control that will shut off the power when the pressure is released:

- All hand-held powered circular saws with a blade diameter-greater than 2 inches;
- Electric, hydraulic or pneumatic chain saws; and
- Percussion tools without positive accessory holding means.

All hand-held gasoline powered chain saws must have a constant pressure throttle control that will shut off the power to the saw chain when the pressure is released.

(2) The following powered tools must have a constant pressure switch or control:

- All hand-held powered drills, tappers, fastener drivers, and horizontal, vertical, and angle grinders with wheels greater than 2 inches in diameter;

- Disc sanders with discs greater than 2 inches in diameter;

- Belt sanders;
- Reciprocating saws;
- Saber, scroll, and jig saws with blade shanks greater than a nominal 1/4 inch; and
- Other similarly operating powered tools.

These tools may have a lock-on control if they can be turned off by a single motion of the same finger or fingers that turn it on.

(3) The following powered tools must have either a positive on-off control, or other controls as described above:

- All other hand-held powered tools, including:
- Platen sanders;
- Grinders with wheels 2 inches in diameter or less;
- Disc sanders with discs 2 inches in diameter or less;
- Routers;
- Planers;
- Laminate trimmers;
- Nibblers;
- Shears; and
- Saber, scroll, and jig saws with blade shanks a nominal 1/4 inch wide or less.

(a) Saber, scroll, and jig saws with nonstandard blade holders may use blades with shanks that are nonuniform in width, if the narrowest portion of the blade shank is an integral part in mounting the blade.

(b) Blade shank width must be measured at the narrowest portion of the blade shank when saber, scroll, and jig saws have nonstandard blade holders.

(c) "Nominal" in this section means +0.05 inch.

(4) The operating control on hand-held power tools must be located to minimize the possibility of accidental operation that would constitute a hazard to employees.

Exception: This section does not apply to concrete vibrators, concrete breakers, powered tampers, jack hammers, rock drills, garden appliances, household and kitchen appliances, personal care appliances, or to fixed machinery.

[Recodified as § 296-307-20510. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-20510, filed 10/31/96, effective 12/1/96.]

WAC 296-307-20515 What requirements apply to pneumatic powered tools and hose? (1) The operating trigger on portable pneumatic powered tools must be located to minimize the possibility of accidental operation and arranged to close the air inlet valve automatically when the operator removes pressure.

(2) A tool retainer must be installed on each tool that would otherwise be ejected from the hose.

(3) Hose and hose connections used for conducting compressed air to utilization equipment must be designed for the pressure and service to which they are subjected.

[Recodified as § 296-307-20515. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-20515, filed 10/31/96, effective 12/1/96.]

WAC 296-307-220 Power lawnmowers.

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[Recodified as § 296-307-220. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-220, filed 10/31/96, effective 12/1/96.]

WAC 296-307-22003 What definitions apply to this section? "Blade tip circle" means the path described by the outermost point of the blade as it rotates about its shaft axis.

"Catcher assembly" means a part that provides a means for collecting grass clippings or debris.

"Deadman control" means a control designed to automatically interrupt power to a drive when the operator releases the control.

"Guard" means a part for shielding a hazardous area of a machine.

"Lowest blade position" means the lowest blade position when the mower is not in use.

"Operator area" (walk-behind mowers) means a circular area behind the mower that is no smaller than 30 inches in diameter, the center of which is 30 inches behind the nearest blade tip circle.

"Power reel mower" means a lawn-cutting machine with a power source that rotates one or more helically formed blades about a horizontal axis and creates a shearing action with a stationary cutter bar or bed knife.

"Power rotary mower" means a lawn-cutting machine with a power source that rotates one or more cutting blades about a vertical axis.

"Riding mower" means a powered, self-propelled lawn-cutting vehicle on which the operator rides and controls the machine.

"Sulky type mower" means a walk-behind mower that has been converted to a riding mower by the addition of a sulky.

"Walk-behind mower" means a mower either pushed or self-propelled and normally guided by the operator walking behind the unit.

[Recodified as § 296-307-22003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-22003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-22006 What are the general guarding requirements for power lawnmowers? (1) Walk-behind, riding-rotary, and reel power lawnmowers designed for use by employees must meet the design specifications in ANSI B71.1-1968.

Exception: These specifications do not apply to sulky-type mowers, flail mowers, sickle-bar mowers, or mowers designed for commercial use.

(2) All power-driven chains, belts, and gears must be positioned or guarded to prevent accidental contact with the operator during normal starting, mounting, and operation of the machine.

(3) The motor must have a shut-off device that requires manual and intentional reactivation to restart the motor.

(4) All positions of the operating controls must be clearly identified.

(5) The words, "Caution — Be sure the operating control(s) is in neutral before starting the engine," or similar wording must be clearly visible at an engine starting control point on self-propelled mowers.

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(6) All power lawn mowers must be used according to the manufacturer's instructions.

[Recodified as § 296-307-22006. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-22006, filed 10/31/96, effective 12/1/96.]

WAC 296-307-22009 What rules apply to walk-behind and riding rotary mowers? (1) The mower blade must be enclosed except on the bottom and the enclosure must extend to or below the lowest blade position.

(2) Guards that must be removed to install a catcher assembly must meet the following requirements:

(a) Warning instructions are attached to the mower near the opening stating that the mower must not be used without either the catcher assembly or the guard in place.

(b) The mower is used only with either the catcher assembly or the guard in place.

(c) The catcher assembly is properly and completely installed.

(3) The word "caution" or stronger wording must be placed on the mower at or near each discharge opening.

(4) Blade(s) must stop rotating from the manufacturer's specified maximum speed within 15 seconds after declutching, or shutting off power.

[Recodified as § 296-307-22009. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-22009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-22012 What rules apply to walk-behind rotary mowers? (1) The horizontal angle of the grass discharge opening(s) in the blade enclosure must not contact the operator area.

(2) There must be one of the following at all grass discharge openings:

(a) A minimum of 3 inches between the end of the discharge chute and the blade tip circle; or

(b) A rigid bar fastened across the discharge opening, secured to prevent removal without the use of tools. The bottom of the bar must be no higher than the bottom edge of the blade enclosure.

(3) The highest point(s) on the blade enclosure front, except discharge-openings, must be a maximum of 1-1/4 inches above the lowest blade position. Mowers with a swing-over handle are considered to have no front in the blade enclosure and therefore must comply with WAC 296-307-22009(1).

(4) The mower handle must be fastened to the mower to prevent loss of control by unintentional uncoupling while in operation.

(5) Mower handles must be locked in the normal operating position(s) so that they cannot be accidentally disengaged during normal mower operation.

(6) A swingover handle must meet the requirements of this section.

(7) Wheel drive disengaging controls, except deadman controls, must move opposite to the direction of the vehicle motion in order to disengage the drive. Deadman controls may operate in any direction to disengage the drive.

(8) You must ensure that each walk-behind rotary mower has a positive constant-pressure device that requires the operator to hold the device in the "on" position to operate the

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mower. Using rope or string or other material to tie the constant pressure device in the "on" position is prohibited.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-22012, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-22012. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-22012, filed 10/31/96, effective 12/1/96.]

WAC 296-307-22015 What rules apply to riding rotary mowers? (1) The highest point(s) of all openings in the blade enclosure front must be a maximum of 1 1/4 inches above the lowest blade position.

(2) Opening(s) must not allow grass or debris to discharge directly toward the operator seated in normal operator position.

(3) There must be one of the following at all grass discharge openings:

(a) A minimum of 6 inches between the end of the discharge chute and the blade tip circle; or

(b) A rigid bar fastened across the discharge opening secured to prevent removal without the use of tools. The bottom of the bar must be no higher than the bottom edge of the blade enclosure.

(4) Mowers must have stops to prevent jackknifing or locking of the steering mechanism.

(5) The mower must have brakes.

(6) Hand-operated wheel drive disengaging controls must move opposite to the direction of vehicle motion in order to disengage the drive. Foot-operated wheel drive disengaging controls must be depressed to disengage the drive. Deadman controls, both hand and foot operated, may operate in any direction to disengage the drive.

[Recodified as § 296-307-22015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-22015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-225 Jacks.

[Recodified as § 296-307-225. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-225, filed 10/31/96, effective 12/1/96.]

WAC 296-307-22503 What definitions apply to this section? "Jack" means an appliance for lifting and lowering or moving horizontally a load using a pushing force.

Note: Jack types include lever and ratchet, screw, and hydraulic.

"Rating" means the maximum working load for which a jack is designed to lift the load safely throughout its travel.

[Recodified as § 296-307-22503. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-22503, filed 10/31/96, effective 12/1/96.]

WAC 296-307-22506 How shall the rated load be marked on a jack? (1) The operator must make sure that the jack used has a load rating sufficient to lift and sustain the load.

(2) The rated load must be legibly and permanently marked in a prominent location on the jack by casting, stamping, or other suitable means.

Note: You should follow the manufacturer's specifications to raise the rated load of a jack.

[Recodified as § 296-307-22506. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-22506, filed 10/31/96, effective 12/1/96.]

WAC 296-307-22509 What rules apply to the operation and maintenance of jacks? (1) If the foundation is not firm, you must block the base of the jack. If the cap might slip, you must place a block in between the cap and the load.

(2) The operator must watch the stop indicator, which must be kept clean, in order to determine the limit of travel. The indicated limit must not be overrun.

(3) After the load has been raised, it must immediately be cribbed, blocked, or otherwise secured. Working under a load raised only with jacks is prohibited.

(4) Hydraulic jacks exposed to freezing temperatures must be supplied with an adequate antifreeze liquid.

(5) All jacks must be properly lubricated at regular intervals. The lubricating instructions of the manufacturer should be followed, and only lubricants recommended by the manufacturer should be used.

(6) You must ensure that each jack is thoroughly inspected according to the service conditions and at least:

(a) For constant or intermittent use at one locality, once every 6 months;

(b) For jacks sent out of shop for special work, when sent out and when returned;

(c) For a jack subjected to abnormal load or shock, immediately before and immediately thereafter.

(7) Repair or replacement parts must be examined for possible defects.

(8) Jacks that are out of order must be tagged, and not be used until repaired.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-22509, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-22509. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-22509, filed 10/31/96, effective 12/1/96.]

WAC 296-307-230 What are the general requirements for materials handling and storage? (1) Safe clearances of three feet must be allowed for aisles, loading docks, doorways, and wherever turns or passage must be made. Passageways must be kept clear and in good repair, with no obstructions.

(2) Bags, bales, boxes, and other containers stored in tiers must be made secure against sliding or collapse.

(3) Storage areas must be kept free from any accumulation of materials that could cause tripping, fire, or explosion.

(4) Employees must be instructed in proper lifting or moving techniques and methods. Mechanical devices or assistance in lifting must be used when moving heavy objects.

(5) When removing material stored in piles, employees must remove material in a manner that maintains the stability of the pile and prevents collapse.

(6) Storage areas must have proper drainage.

(7) You must provide clearance signs to warn of clearance limits.

(8) For powered industrial truck (forklift) requirements, see WAC 296-307-520.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-230, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-230. 97-09-013, filed

[Title 296 WAC—p. 2544]

4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-230, filed 10/31/96, effective 12/1/96.]

WAC 296-307-232 What requirements apply to conveyors? Conveyors must be constructed, operated, and maintained according to ANSI B 20.1-1957.

(1) When the return strand of a conveyor operates within seven feet of the floor, there must also be a trough strong enough to carry the weight resulting from a broken chain.

(2) If the strands are over a passageway, a means must be provided to catch and support the ends of the chain in the event of a break.

(3) When the working strand of a conveyor crosses within three feet of the floor level in passageways, a bridge must be provided for employees to cross over the conveyor.

(4) Whenever conveyors pass adjacent to or over working areas or passageways, protective guards must be installed. These guards must be designed to catch and hold any load or materials that may fall off or dislodge and injure an employee.

(5) Employees must be prohibited from walking on the rolls of roller-type conveyors. If employees must walk on roller-type conveyors because of an emergency, the conveyor must be shut off first.

(6) Guards, screens, or barricades that are strong enough to prevent material from falling must be installed on all sides of the shaftway of elevator-type conveyors except at openings where material is loaded or unloaded. Automatic shaftway gates or suitable barriers must be installed at each floor level where material is loaded or unloaded from the platform.

(7) Conveyors must have an emergency stopping device that can be reached from the conveyor. The device must be located near the material entrance to each chopper, mulcher, saw, or similar equipment. The device must be located so that it can stop the conveyor before an employee enters the point of operation of the machine fed by the conveyor.

EXCEPTION: The emergency stopping device is not required where the conveyor leading into the equipment is under constant control of an operator with full view of the material entrance and the conveyor is located where the operator cannot fall onto it.

(8) Where conveyors are over seven feet high, means must be provided to safely permit essential inspection and maintenance operations.

(9) Any part showing signs of significant wear must be inspected carefully and replaced before it creates a hazard.

(10) Replacement parts must be equal to or exceed the manufacturer's specifications.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-232, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-232. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-232, filed 10/31/96, effective 12/1/96.]

Part N

Sanitation for Indoor Workplaces

WAC 296-307-240 Sanitation for fixed, indoor workplaces.

[Recodified as § 296-307-240. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-240, filed 10/31/96, effective 12/1/96.]

WAC 296-307-24001 Must an employer comply with state health regulations? You must comply with the rules and regulations of the state board of health governing sanitation in the workplace. We enforce these regulations according to RCW 43.20.050.

[Recodified as § 296-307-24001. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24001, filed 10/31/96, effective 12/1/96.]

WAC 296-307-24003 What does this section cover? WAC 296-307-240 covers sanitation for employees who normally work in fixed, indoor places of agricultural employment.

A "fixed, indoor workplace" is one where the employees perform a majority of their duties at that site.

This does not cover field employees who only occasionally enter a shop or other farm building as part of their normal duties. Field employees are covered by the field sanitation requirements of WAC 296-307-095.

This section does not cover measures for the control of toxic materials.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-24003, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-24003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-24006 What definitions apply to this section? "Lavatory" means a basin used exclusively for washing hands, arms, face, and head.

"Personal service room" means a room used for activities not directly connected with the business function of the employer. Such activities include but are not limited to, first aid, medical services, dressing, showering, toilet use, washing, and eating.

"Potable water" means water that meets state or local quality standards for drinking water, or water that meets the quality standards of the Environmental Protection Agency's "National Interim Primary Drinking Water Regulations," published in 40 CFR, Part 141, and 40 CFR 147.2400.

"Toilet facility" means a fixture maintained within a toilet room for the purpose of defecation or urination, or both.

"Toilet room" means a room maintained within or on the premises of any place of employment, containing toilet facilities for employee use.

"Toxic material" means a material that exceeds a regulatory limit (such as in chapter 296-62 WAC), or toxicity that causes or is likely to cause death or serious physical harm.

"Urinal" means a toilet facility maintained within a toilet room for the sole purpose of urination.

"Water closet" means a toilet facility maintained within a toilet room for the purpose of both defecation and urination and which is flushed with water.

"Wet process" means any process or operation in a workroom that normally results in walking or standing surfaces becoming wet.

(1999 Ed.)

[Recodified as § 296-307-24006. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24006, filed 10/31/96, effective 12/1/96.]

WAC 296-307-24009 What housekeeping requirements apply to fixed, indoor workplaces? (1) You must ensure that all places of employment are kept clean to the extent that the work allows.

(2) You must ensure that the floor of every workroom is kept as dry as possible. Where wet processes are used, you must maintain drainage. You must provide false floors, platforms, mats, or other dry standing places where practical, or provide appropriate waterproof footwear.

(3) To facilitate cleaning, every floor, working place, and passageway must be kept free from protruding nails, splinters, loose boards and unnecessary holes and openings.

(4) Cleaning and sweeping must be done to minimize dust in the air and when practical, done outside of working hours.

[Recodified as § 296-307-24009. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-24012 How must the potable water supply be maintained? (1) You must provide potable water in all places of employment, for drinking, washing of the person, cooking, washing food, washing cooking or eating utensils, washing food preparation or processing premises, and for personal service rooms.

(2) Potable drinking water dispensers must be maintained in sanitary condition, be closeable, and have a tap.

(3) Open containers for drinking water from which the water must be dipped or poured, even if fitted with a cover, are prohibited.

(4) A common drinking cup and other common utensils are prohibited.

[Recodified as § 296-307-24012. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24012, filed 10/31/96, effective 12/1/96.]

WAC 296-307-24015 How must the nonpotable water supply be maintained? (1) You must ensure that nonpotable water is marked as unsafe and is not used for drinking, washing of the person, cooking, washing food, washing cooking or eating utensils, washing food preparation or processing premises, or personal service rooms, or for washing clothes.

(2) Nonpotable water used for cleaning any other work premises must be free of concentrations of chemicals, fecal coliform, or other substances that could create unsanitary conditions or be harmful to employees.

(3) Nonpotable water systems or systems carrying any other nonpotable substance must be constructed to prevent backflow or backsiphonage into a potable water system.

[Recodified as § 296-307-24015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-24018 What toilet facilities must an employer provide? (1) You must provide toilet facilities, with separate toilet rooms for each sex, according to the requirements in the table below. You must provide facilities

for each sex based on the number of employees of that sex for whom facilities are furnished.

(2) Where single-occupancy rooms have more than one toilet facility, only one facility in each toilet room counts toward these requirements.

In this table, "number of employees" means the maximum number of employees present at any one time on a regular shift.

Number of employees	Minimum number of water closets
1 to 15	1
16 to 35	2
36 to 55	3
56 to 80	4
81 to 110	5
111 to 150	6
Over 150	One additional fixture for each additional 40 employees

(3) Where toilet rooms are occupied by one person at a time, can be locked from the inside, and contain at least one water closet, separate toilet rooms for each sex need not be provided.

(4) Where toilet facilities will not be used by women, urinals may be provided instead of water closets, except that the number of water closets must not be less than 2/3 of the minimum specified.

(5) The sewage disposal method must not endanger the health of employees.

(6) Toilet paper with holder must be provided for every water closet.

(7) Each water closet must occupy a separate compartment with a door and walls or partitions between fixtures high enough to ensure privacy.

[Recodified as § 296-307-24018. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24018, filed 10/31/96, effective 12/1/96.]

WAC 296-307-24021 What washing facilities must an employer provide? You must provide facilities for maintaining personal cleanliness in the workplace. The facilities must be convenient for employees and maintained in a sanitary condition.

[Recodified as § 296-307-24021. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24021, filed 10/31/96, effective 12/1/96.]

WAC 296-307-24024 What requirements apply to lavatories? (1) You must ensure that lavatories are available in all workplaces.

(2) Each lavatory must have hot and cold running water, or tepid running water.

(3) You must provide hand soap or similar cleansing agent.

(4) You must provide individual hand towels, warm air blowers, or clean individual sections of continuous cloth toweling convenient to the lavatories.

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[Recodified as § 296-307-24024. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24024, filed 10/31/96, effective 12/1/96.]

WAC 296-307-24027 When must an employer provide change rooms? (1) Whenever employees are required by a WISHA standard to wear protective clothing because of the possibility of contamination with toxic materials, you must provide change rooms with separate storage facilities for street clothes and for the protective clothing.

(2) If you provide work clothes for employees, they must be dry.

[Recodified as § 296-307-24027. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24027, filed 10/31/96, effective 12/1/96.]

WAC 296-307-24030 What requirements apply to consumption of food and beverages in the workplace? (1) This section applies to workplaces where employees may consume food, beverages, or both on the premises.

(2) No employee may consume food or beverages in a toilet room nor in any area exposed to a toxic material.

(3) If your workplace exposes employees to injurious dusts or other toxic materials, you must provide a separate lunchroom unless it is convenient for employees to lunch away from the premises. The size of the lunchroom must be based on the maximum number of persons using the room at one time, according to the following table.

Number of persons	Square feet per person
25 and less	13
26 - 74	12
75 - 149	11
150 and over	10

(4) You must provide receptacles of smooth, corrosion resistant, easily cleanable, or disposable materials for the disposal of waste food. You must provide enough receptacles to encourage their use and to prevent overfilling. Receptacles must be emptied at least once a working day and maintained in sanitary condition. Receptacles must have a solid tight-fitting cover unless sanitary condition can be maintained without a cover.

(5) No food or beverages may be stored in toilet rooms or in an area exposed to toxic material.

(6) All employee food service facilities and operations must follow sound hygienic principles. If all or part of the food service is provided, the food dispensed must be wholesome and free from spoilage. Food must be processed, prepared, handled, and stored so as to prevent contamination.

[Recodified as § 296-307-24030. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24030, filed 10/31/96, effective 12/1/96.]

WAC 296-307-24033 How must waste be stored and removed? (1) You must ensure that any receptacle used for waste or garbage that may rot is constructed so that it does not leak and can be thoroughly cleaned and maintained in a sanitary condition. A receptacle must have a solid tight-fitting cover, unless it can be maintained in a sanitary condition

without a cover. Receptacles designed to maintain sanitary condition may be used in place of this requirement.

(2) All sweepings, solid or liquid wastes, refuse, and garbage must be removed to avoid creating a health menace, and as often as necessary to maintain the workplace in a sanitary condition.

[Recodified as § 296-307-24033. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24033, filed 10/31/96, effective 12/1/96.]

WAC 296-307-24036 When must an employer have a vermin control program? Every building with personal service, food preparation, or eating rooms must be constructed, equipped, and maintained to restrict infestation by rodents, insects, and other vermin. You must have a continuing and effective extermination program where vermin are present.

[Recodified as § 296-307-24036. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-24036, filed 10/31/96, effective 12/1/96.]

Part O

Walking Working Surfaces; Fixed Industrial Stairs; Aerial Manlifts

WAC 296-307-250 Walking working surfaces, elevated walkways, and platforms.

[Recodified as § 296-307-250. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-250, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25003 What definitions apply to this section? "Floor hole" means an opening with the smallest dimension between one and 12 inches, in any floor, platform, pavement, or yard, through which materials may fall but not people. Examples are a belt hole, pipe opening, or slot opening.

"Floor opening" means an opening with the smallest dimension of 12 inches or more, in any floor, platform, pavement, or yard, through which people may fall. Examples are a hatchway, stair or ladder opening, pit, or large manhole. Floor openings occupied by elevators, dumb waiters, conveyors, machinery, or containers are excluded from this definition.

"Handrail" means a single bar or pipe supported on brackets from a wall or partition to furnish persons with a handhold in case of tripping.

"Platform" means a working space for people that is elevated above the surrounding floor or ground, such as a balcony or platform for the operation of machinery and equipment.

"Runway" means a passageway used by people that is elevated above the surrounding floor or ground level, such as a footwalk along shafting or a walkway between buildings.

"Standard railing" means a vertical barrier along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent people from falling.

"Standard strength and construction" means any construction of railings, covers, or other guards that meets the requirements of this section.

"Stair railing" means a vertical barrier along exposed sides of a stairway to prevent people from falling.

"Toeboard" means a vertical barrier at floor level along exposed edges of a floor opening, wall opening, platform, runway, or ramp to prevent materials from falling.

"Wall hole" means an opening between one and 30 inches high, of any width, in any wall or partition, such as a ventilation hole or drainage scupper.

"Wall opening" means an opening at least 30 inches high and 18 inches wide, in any wall or partition, through which people may fall, such as a yard-arm doorway or chute opening.

[Recodified as § 296-307-25003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25006 When may railings be omitted? Railings may be omitted from sections of open-sided floors, platforms, or walkways where guard rails impair operations, if railings are replaced when they no longer impair operations.

[Recodified as § 296-307-25006. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25006, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25009 What protection must an employer provide for floor openings? (1) Every stairway floor opening must be guarded by a standard railing constructed according to this section. The railing must guard all exposed sides (except the entrance to the stairway). Infrequently used stairways where traffic across the opening prevents using a fixed standard railing (as when located in aisle spaces, etc.), may use an alternate guarding method. In these cases, the guard must have a hinged floor opening cover of standard strength and construction and removable standard railings on all exposed sides (except at the entrance to the stairway).

(2) Every ladderway floor opening or platform must be guarded by a standard railing with standard toeboard on all exposed sides (except at the entrance to the opening). The passage through the railing must have either a swinging gate or offset so that a person cannot walk directly into the opening.

(3) Every hatchway and chute floor opening must be guarded by one of the following:

(a) A hinged floor opening cover of standard strength and construction with standard railings, or a permanent cover with only one side exposed. When the opening is not in use, the cover must be closed or the exposed side must be guarded at both the top and middle by removable standard railings.

(b) A removable railing with toeboard on a maximum of two sides of the opening and with fixed standard railings and toeboards on all other exposed sides. The removable railings must be kept in place when the opening is not in use and should be hinged or mounted to be easily replaced.

(4) When employees must feed material into any hatchway or chute opening, you must provide protection to prevent people from falling through the opening.

(5) When practical, the area under floor openings must be fenced off. Otherwise, the area must be plainly marked with yellow lines and telltales hanging within 5-1/2 feet of the ground or floor level.

(6) Where floor openings are used to drop materials from one level to another, audible warning systems must be installed and used to indicate to employees on the lower level when material is dropped.

(7) Every skylight opening and hole must be guarded by a standard skylight screen or a fixed standard railing on all exposed sides.

(8) Every infrequently used pit and trapdoor floor opening must be guarded by a floor opening cover of standard strength and construction that should be hinged in place. When the cover is not in place, the pit or trap opening must be constantly attended or protected on all exposed sides by removable standard railings.

(9) Every manhole floor opening must be guarded by a standard manhole cover. The manhole cover may be left unhinged. When the cover is removed, the manhole opening must be constantly attended or protected by removable standard railings.

(10) Every temporary floor opening must have standard railings or must be constantly attended.

(11) Every floor hole that people can accidentally walk into must be guarded by either:

(a) A standard railing with standard toeboard on all exposed sides; or

(b) A floor hole cover of standard strength and construction that should be hinged in place. While the cover is not in place, the floor hole must be constantly attended or protected by a removable standard railing.

(12) Every floor hole surrounded by fixed machinery, equipment, or walls that prevent people from walking into it, must be protected by a cover that leaves openings a maximum of one inch wide. The cover must be securely held in place to prevent tools or materials from falling through.

(13) Where doors or gates open directly on a stairway, a platform must be provided so that the swing of the door does not reduce the platform width to less than 20 inches.

[Recodified as § 296-307-25009, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25012 What protection must an employer provide for wall openings and holes? (1) Every wall opening from which there is a drop of more than 4 feet must be guarded by one of the following:

(a) A rail, roller, picket fence, half door, or equivalent barrier.

The guard may be removable but should be hinged or mounted so it can be easily replaced. When employees working below the opening are exposed to falling materials, a removable toeboard or the equivalent must also be provided. When the opening is unused, the guard must be kept in position even with a door on the opening. In addition, a grab handle must be provided on each side of the opening with its center approximately 4 feet above floor level and of standard strength and mounting.

(b) An extension platform onto which materials can be hoisted for handling, and that has side rails or equivalent guards of standard specifications.

(2) Every chute wall opening from which there is a drop of more than 4 feet must be guarded according to subsection (1) of this section or as required by the conditions.

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(3) Every window wall opening at a stairway landing, floor, platform, or balcony, from which there is a drop of more than 4 feet, and where the bottom of the opening is less than 3 feet above the platform or landing, must be guarded by standard slats, standard grillwork according to WAC 296-307-25042(3), or a standard railing.

Where the window opening is below the landing, or platform, a standard toeboard must be provided.

(4) Every temporary wall opening must have adequate guards that may be of less than standard construction.

(5) Where there is a hazard of materials falling through a wall hole, and the lower edge of the near side of the hole is less than 4 inches above the floor, and the far side of the hole is more than 5 feet above the next lower level, the hole must be protected by a standard toeboard or a solid enclosing screen, or according to WAC 296-307-25042(3).

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-25012, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-25012. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25012, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25015 What protection must an employer provide for open-sided floors, platforms, and runways? (1) Every open-sided floor or platform 4 feet or more above an adjacent floor or ground level must be guarded by a standard railing (or the equivalent according to WAC 296-307-25027) on all open sides, except where there is an entrance to a ramp, stairway, or fixed ladder. The railing must have a toeboard wherever, beneath the open sides:

(a) A person can pass; or

(b) There is moving machinery; or

(c) Materials falling onto equipment would create a hazard.

(2) Every runway must be guarded by a standard railing (or the equivalent according to WAC 296-307-25027) on all open sides that are 4 feet or more above floor or ground level. Wherever tools, machine parts, or materials are likely to be used on the runway, a toeboard must also be provided on each exposed side.

Runways used exclusively for special purposes (such as oiling, shafting, or filling tank cars) may have the railing on one side omitted when operating conditions require, if the hazard is minimized by using a runway at least 18 inches wide. Where people entering runways become exposed to machinery, electrical equipment, or hazards other than from falling, additional guarding may be necessary.

(3) Regardless of height, all open-sided floors, walkways, platforms, or runways above or adjacent to dangerous equipment, pickling or galvanizing tanks, degreasing units, or similar hazardous equipment, must be guarded with a standard railing and toeboard.

(4) Tools and loose materials must not be left on overhead platforms and scaffolds.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-25015, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-25015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25018 What requirements apply to stairway railings and guards? (1) Every flight of stairs hav-

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ing four or more risers must have standard stair railings or standard handrails as follows (stairway widths measured clear of all obstructions except handrails):

(a) Stairways less than 44 inches wide with both sides enclosed must have at least one handrail, preferably on the right side descending.

(b) Stairways less than 44 inches wide with one side open must have at least one stair railing on the open side.

(c) Stairways less than 44 inches wide with both sides open must have one stair railing on each side.

(d) Stairways more than 44 inches wide but less than 88 inches wide must have one handrail on each enclosed side and one stair railing on each open side.

(e) Stairways 88 or more inches wide must have one handrail on each enclosed side, one stair railing on each open side, and one intermediate stair railing at the approximate middle.

Exception: Vehicle service pit stairways are exempt from this requirement if hand or stair rails would prevent vehicle movement into position over the pit.

(2) Winding stairs must have a handrail that prevents walking on all portions of the treads that are less than 6 inches wide.

(3) Nonindustrial and "monumental" steps are exempt from the requirements of this section. However, public and private building steps at loading or receiving docks, in maintenance areas, etc., and stairs used exclusively by employees, must meet the requirements of this section.

[Recodified as § 296-307-25018, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25018, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25021 How must a standard railing be constructed? A standard railing must meet the following requirements:

(1) The railing has a top rail, intermediate rail, and posts.

(2) The railing height is between thirty-six and forty-two inches nominal from the upper surface of the top rail to the floor, platform, runway, or ramp level.

(3) The top rail is smooth.

(4) The intermediate rail is approximately halfway between the top rail and the floor, platform, runway, or ramp.

(5) The ends of the rails do not overhang the terminal posts except where the overhang does not create a hazard.

(6) Guardrails taller than 42 inches are constructed so they do not create a hazard. Additional mid-rails are installed so that openings beneath the top rail prevent a spherical object with a 19-inch or larger diameter from falling through.

[Recodified as § 296-307-25021, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25021, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25024 How must a stair railing be constructed? A stair railing must be constructed similar to a standard railing. The stair railing must be between 34 and 30 inches tall measured from the top of the top rail to the tread surface meeting the face of the riser at the forward edge of the tread.

[Recodified as § 296-307-25024, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25024, filed 10/31/96, effective 12/1/96.]

(1999 Ed.)

WAC 296-307-25027 What are the requirements for railing dimensions? Standard railings must meet the following requirements:

(1) For wood railings:

(a) The posts are of at least two inch by four inch nominal stock spaced six feet apart or less; and

(b) The top and intermediate rails are of at least two inch by four inch nominal stock.

(c) If the top rail is made of two right-angle pieces of 1-inch by 4-inch stock, posts are spaced on 8-foot centers, with 2-inch by 4-inch intermediate rail.

(2) For pipe railings:

(a) The posts and top and intermediate railings are at least 1-1/2 inches nominal diameter (outside diameter); and

(b) The posts are spaced on centers of eight feet or less.

(3) For structural steel railings:

(a) The posts and top and intermediate rails are of 2-inch by 2-inch by 3/8-inch angles or other metal shapes of equivalent bending strength; and

(b) The posts are spaced on centers of eight feet or less.

(4) Post anchors and framing parts for all railings are constructed so that the completed structure can withstand a load of at least two hundred pounds applied in any direction at any point on the top rail.

(5) Other types, sizes, and arrangements of railing construction that meet the following requirements are acceptable:

(a) The top rail is smooth;

(b) The top rail is between thirty-six and forty-two inches nominal above the floor, platform, runway, or ramp level;

(c) The railing is strong enough to withstand two hundred pounds of pressure on the top rail;

(d) The railing provides protection between the top rail and the floor, platform, runway, ramp, or stair treads, equivalent to that of a standard intermediate rail;

(e) There are no overhanging rail ends unless the overhang does not create a hazard; such as baluster railings, scrollwork railings, or paneled railings.

Note: The dimensions specified are based on the U.S. Department of Agriculture Wood Handbook, No. 72, 1955 (No. 1 (S4S) Southern Yellow Pine (Modulus of Rupture 7,400 psi)) for wood; ANSI G 41.5-1970, American National Standard Specifications for Structural Steel, for structural steel; and ANSI B 125.1-1970, American National Standard Specifications for Welded and Seamless Steel Pipe, for pipe.

[Recodified as § 296-307-25027, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25027, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25030 What requirements apply to toeboards? (1) Standard toeboard height is at least four inches nominal from its top edge to the level of the floor, platform, runway, or ramp. The toeboard must be securely fastened in place and with a maximum of 1/4 inch clearance above floor level. It must be made of any substantial material that is either solid or with openings that are a maximum of one inch in diameter.

(2) Where material is piled high enough that a standard toeboard does not provide protection, paneling from the floor to the intermediate rail, or to the top rail, must be provided.

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[Recodified as § 296-307-25030, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25030, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25033 How must handrails and railings be constructed? (1) A handrail must have a horizontal part mounted directly on a wall or partition by brackets attached to the lower side of the handrail. The brackets must be attached to ensure that there is a smooth surface along the top and both sides of the handrail. The handrail must be rounded or otherwise provide an adequate handhold for anyone grasping it to avoid falling. The ends of the handrail should be turned in to the supporting wall or arranged to prevent a projection hazard.

(2) Handrails must be a maximum of thirty-four inches high and at least thirty inches from the upper surface of the handrail to the surface of the tread in line with the face of the riser or to the surface of the ramp.

(3) The size of handrails must be:

(a) For hardwood, at least two inches in diameter.

(b) For metal pipe, at least 1-1/2 inches in diameter.

(4) Brackets must be spaced a maximum of eight feet apart.

(5) Handrail mounting must be strong enough to withstand a load of at least two hundred pounds applied in any direction at any point on the rail.

(6) All handrails and railings shall have a clearance of at least 1-1/2 inches between the handrail or railing and the wall or any other object.

[Recodified as § 296-307-25033, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25033, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25036 What materials may be used for floor opening covers? Floor opening covers must be made of any material that meets the following strength requirements:

(1) Trench or conduit covers and their supports, when located in plant roadways, must be designed to carry a truck rear-axle load of at least 20,000 pounds.

(2) Manhole covers and their supports, when located in plant roadways, must meet local standard highway requirements if any; otherwise, they must be designed to carry a truck rear-axle of at least 20,000 pounds.

(3) Other floor opening covers must be made of any material that can carry a truck rear-axle load of at least 20,000 pounds. Covers may project a maximum of one inch above the floor level if all edges are chamfered to a maximum angle with the horizontal of thirty degrees. All hinges, handles, bolts, or other parts must set flush with the floor or cover surface.

[Recodified as § 296-307-25036, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25036, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25039 How must skylight screens be constructed and mounted? Skylight screens must be constructed and mounted to withstand a load of at least two hundred pounds applied perpendicularly anywhere on the screen. Skylight screen must be constructed and mounted so that, under ordinary loads or impacts, they will not deflect downward enough to break the glass below them. They must be

constructed of grillwork with openings a maximum of four inches long or of slatwork with openings a maximum of two inches wide and any length.

[Recodified as § 296-307-25039, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25039, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25042 What protection must an employer provide for wall openings? (1) Wall opening barriers (rails, rollers, picket fences, and half doors) must be constructed and mounted, to withstand a load of at least two hundred pounds applied in any direction (except upward) at any point on the top rail.

(2) Wall opening grab handles must be at least twelve inches long and must be mounted to give 1-1/2 inches clearance from the side framing of the wall opening. The size, material, and anchoring of the grab handle must form a structure that can withstand a load of at least two hundred pounds applied in any direction at any point of the handle.

(3) Wall opening screens must be constructed and mounted to withstand a load of at least two hundred pounds applied horizontally anywhere on the near side of the screen. They must be of solid construction, of grillwork with openings a maximum of four inches long, or of slatwork with openings a maximum of two inches wide and any length.

[Recodified as § 296-307-25042, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25042, filed 10/31/96, effective 12/1/96.]

WAC 296-307-260 Fixed industrial stairs.

[Recodified as § 296-307-260, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-260, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26003 What does this section cover? WAC 296-307-260 covers the safe design and construction of fixed general industrial stairs. Fixed general industrial stairs includes interior and exterior stairs around machinery, tanks, and other equipment, and stairs leading to or from floors, platforms, or pits.

This section does not apply to stairs used for fire exits, to construction operations, to private buildings or residences, or to articulated stairs that are installed on floating roof tanks or on dock facilities, where the angle changes with the rise and fall of the base support.

Stairs of public and private buildings at loading or receiving docks, in maintenance areas, etc., or stairs that are used exclusively by employees, are considered "fixed industrial steps" and must meet these requirements.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-26003, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-26003, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26006 What definitions apply to this section? "Nose or nosing" means the part of a tread projecting beyond the face of the riser immediately below.

"Open riser" means the air space between the treads of stairways without risers.

"Platform" means an extended step or landing breaking a continuous run of stairs.

"Railing" means a vertical barrier erected along exposed sides of stairways and platforms to prevent people from falling. The top part of the railing usually serves as a handrail.

"Rise" means the vertical distance from the top of a tread to the top of the next higher tread.

"Riser" means the upright part of a step at the back of a lower tread and near the leading edge of the next higher tread.

"Stairs or stairway" means a series of steps. A series of steps and landings having three or more risers constitutes stairs or a stairway.

"Tread" means the horizontal part of a step.

"Tread run" means the horizontal distance from the leading edge of a tread to the leading edge of an adjacent tread.

"Tread width" means the horizontal distance from front to back of tread, including nosing.

[Recodified as § 296-307-26006. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26006, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26009 Where are fixed stairs required? Fixed stairs must be provided for:

(1) Employee access from one structure level to another where operations require regular travel between levels.

(2) Employee access to operating platforms on any equipment that requires regular attention during operations.

(3) Employees that need daily access to elevations, or access at each shift, for purposes such as gauging, inspection, regular maintenance, etc., where:

(a) The work may expose employees to acids, caustics, gases, or other harmful substances; or

(b) Employees must normally carry tools or equipment by hand.

Note: This section does not prohibit the use of fixed ladders for access to elevated tanks, towers, and similar structures, overhead traveling cranes, etc., where the use of fixed ladders is common practice.

[Recodified as § 296-307-26009. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26012 Where are spiral stairs prohibited? Spiral stairways are prohibited except for special limited use and secondary access when a conventional stairway is not practical. Winding stairways may be installed on tanks and similar round structures where the diameter of the structure is a minimum of five feet.

[Recodified as § 296-307-26012. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26012, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26015 How strong must fixed stairs be? Fixed stairways must be designed and constructed to carry a load of five times the normal live load anticipated, and must be at least strong enough to carry safely a moving concentrated load of 1,000 pounds.

[Recodified as § 296-307-26015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26018 How wide must fixed stairs be? Fixed stairways must be at least 22 inches wide.

(1999 Ed.)

[Recodified as § 296-307-26018. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26018, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26021 What angles may stairways be installed at? (1) Fixed stairs must be installed at angles to the horizontal of between thirty and fifty degrees. Any uniform combination of rise/tread dimensions may be used that will provide a stairway at an angle within the permissible range.

The following table lists examples of rise/tread dimensions that will produce a stairway within the permissible range. Rise/tread combinations are not limited to those in the table.

Angle to horizontal	Rise (in inches)	Tread run (in inches)
30°35'	6-1/2	11
32°08'	6-3/4	10-3/4
33°41'	7	10-1/2
35°16'	7-1/4	10-1/4
36°52'	7-1/2	10
38°29'	7-3/4	9-3/4
40°08'	8	9-1/2
41°44'	8-1/4	9-1/4
43°22'	8-1/2	9
45°00'	8-3/4	8-3/4
46°38'	9	8-1/2
48°16'	9-1/4	8-1/4
49°54'	9-1/2	8

(2) A permanent stairway may be installed at an angle above the fifty degree critical angle when space limitations require. Such installations (commonly called inclined ladders or ships ladders) must have handrails on both sides and open risers. They must be capable of sustaining a live load of one hundred pounds per square foot with a safety factor of four. The following preferred and critical angles from the horizontal are recommended for inclined ladders and ships ladders:

(a) 35 to 60 degrees—Preferred angle from horizontal.

(b) 60 to 70 degrees—Critical angle from horizontal.

[Recodified as § 296-307-26021. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26021, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26024 What requirements apply to stair treads? (1) When risers are used, each tread and the top landing of a stairway should have a nose extending 1/2 to one inch beyond the face of the lower riser.

(2) Noses should have an even leading edge.

(3) All treads must be reasonably slip-resistant and the nosings must be of nonslip finish. Welded bar grating treads without nosings are acceptable if the leading edge can easily be identified by employees descending the stairway and the tread is serrated or is nonslip.

(4) Rise height and tread width must be uniform throughout any flight of stairs including any foundation structure used as one or more treads of the stairs.

[Recodified as § 296-307-26024. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26024, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26027 What requirements apply to the length of stairways? Long flights of stairs, unbroken by landings or intermediate platforms, should be avoided. You should consider providing intermediate platforms where practical and for frequently used stairways. Stairway platforms must be at least as wide as the stairway and at least 30 inches long, measured in the direction of travel.

[Recodified as § 296-307-26027. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26027, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26030 What requirements apply to railings and handrails on fixed stairs? Standard railings must be provided on the open sides of all exposed stairways and stair platforms. Handrails must be provided on at least one side of closed stairways, preferably on the right side descending. Stair railings and handrails must be installed according to WAC 296-307-250.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-26030, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-26030. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26030, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26033 What requirements apply to alternating tread-type stairs? "Alternating tread-type stairs" means stairs with a series of steps between 50 and 70 degrees from horizontal, attached to a center support rail in an alternating manner so that a user of the stairs never has both feet at the same level at the same time.

(1) Alternating tread-type stairs must be designed, installed, used, and maintained according to the manufacturer's specifications, and must have the following:

- (a) Stair rails on all open sides;
- (b) Handrails on both sides of enclosed stairs;
- (c) Stair rails and handrails that provide an adequate handhold for a user grasping it to avoid a fall;
- (d) A minimum of 17 inches between handrails;
- (e) A minimum width of 22 inches overall;
- (f) A minimum tread depth of 8 inches;
- (g) A minimum tread width of 7 inches; and
- (h) A maximum rise of 9 1/2 inches to the tread surface of the next alternating tread.

(2) Alternating tread-type stairs must have a maximum 20-foot continuous rise. Where more than a 20-foot rise is necessary to reach the top of a required stair, one or more intermediate platforms must be provided according to WAC 296-307-26027.

(3) Stairs and platforms must be installed so the top landing of the alternating tread stair is flush with the top of the landing platform.

(4) Stair design and construction must sustain a load of at least five times the normal live load, and be at least strong enough to carry safely a moving concentrated load of 1,000 pounds.

(5) Treads must have slip-resistant surfaces.

(6) Where a platform or landing is used, the width must be at least as wide as the stair and at least 30-inches deep in

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the direction of travel. Stairs must be flush with the top of the landing platform.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-26033, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-26033. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26033, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26036 What other requirements apply to fixed stairs? (1) Vertical clearance above any stair tread to an overhead obstruction must be at least 7 feet measured from the leading edge of the tread.

(2) Stairs with treads less than 9 inches wide should have open risers.

(3) Open grating type treads are desirable for outside stairs.

[Recodified as § 296-307-26036. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26036, filed 10/31/96, effective 12/1/96.]

WAC 296-307-270 Aerial manlift equipment.

[Recodified as § 296-307-270. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-270, filed 10/31/96, effective 12/1/96.]

WAC 296-307-27005 What requirements apply to aerial manlift equipment? (1) We will accept safety factor test data on working or structural components from one of the following as evidence that a manlift meets minimum safety requirements:

- (a) The manufacturer;
- (b) A competent testing laboratory;
- (c) A registered engineering firm; or
- (d) A registered engineer.

If, after use, it appears doubtful whether this equipment will meet the above requirements, we may require that tests be conducted, and we may order that you make corrections.

(2) All aerial manlifts must have working brake systems.

(3) Automatic apertures must be installed in the hydraulic systems of aerial manlifts to maintain the boom in position in case any part of the hydraulic pressure system fails.

(4) Controls must be guarded by partial enclosures to minimize accidental contact.

(5) The manufacturer's recommended maximum load limit must be posted conspicuously near the controls and must be kept in a legible condition.

(6) All critical hydraulic and pneumatic components must meet the provisions of ANSI A92.2-1969, Section 4.9 Bursting Safety Factor. Critical components are those which, in case of failure, would cause a free fall or free rotation of the boom. All noncritical components must have a bursting safety factor of at least two to one.

[Recodified as § 296-307-27005. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-27005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-27010 What requirements apply to using aerial manlift equipment? (1) The manufacturer's instructional manual, if any, must be used to establish the proper operational sequences and maintenance procedures. If there is no manual, you must develop instructions. The instructions must be available for reference by operators.

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(2) The assigned operator must make a daily visual inspection and perform the tests recommended by the manufacturer.

(3) Only employees qualified by training or experience may operate aerial manlifts.

(4) Employees must report defective aerial manlift equipment to you as soon as identified. Using defective equipment is prohibited when the defect may cause an accident.

(5) When moving to and from the job site, the basket of the manlift must be in the low position.

(6) Unsafe practices are prohibited, such as, sitting or standing on the basket edge, standing on material placed across the basket, or working from a ladder set inside the basket.

(7) The basket must not be rested on a fixed object so that the weight of the boom is supported by the basket.

(8) The employee and the aerial manlift equipment must maintain distance from high voltage lines according to WAC 296-307-150.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-27010, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-27010, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-27010, filed 10/31/96, effective 12/1/96.]

Part P Guarding Power Transmission Machinery

WAC 296-307-280 Guarding power transmission machinery.

[Recodified as § 296-307-280, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-280, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28002 What power transmission belts are covered by this section? WAC 296-307-280 covers all types and shapes of power transmission belts.

EXCEPTION: The following power transmission belts are exempt from WAC 296-307-280 when operating at 250 feet per minute or less:

- (1) Flat belts that are one inch wide or less.
- (2) Flat belts that are 2" wide or less and are free from metal lacings or fasteners.
- (3) Round belts that are 1/2" in diameter or less.
- (4) Single strand V-belts that are 13/32" wide or less.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28002, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-28002, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28002, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28004 What does "guarded by location" mean? "Guarded by location" means that the location of a component eliminates potential hazards. A component seven feet or more above a working surface is considered guarded by location.

[Recodified as § 296-307-28004, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28004, filed 10/31/96, effective 12/1/96.]

(1999 Ed.)

WAC 296-307-28006 What general requirements apply to machine guarding? (1) All power transmission components must be guarded according to the requirements of this section.

(2) You must protect employees from coming into contact with moving machinery parts by:

(a) A guard or shield or guarding by location; or

(b) A guardrail or fence whenever a guard or shield or guarding by location is infeasible.

(3) Strength and design of guards.

(a) Guards must be designed and located to prevent inadvertent contact with the hazard.

(b) Unless otherwise specified, each guard and its supports must be strong enough to withstand the force that a 250 pound person would exert leaning on or falling against the guard.

(c) Guards must be securely fastened to the equipment or building.

(4) A guard or shield on stationary equipment must be provided at the mesh point or pinch point where the chain or belt contacts the sprocket or pulley.

(5) Machines that will throw stock, material, or objects must be covered or provided with a device designed and constructed to minimize this action. (Machines such as rip saws, rotary mowers and beaters, rotary tillers are included in this classification.)

(6) For requirements relating to the control of hazardous energy (lockout-tagout) see WAC 296-307-320.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28006, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-28006, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28006, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28014 What requirements apply to prime-mover guards? "Flywheels" include flywheels, balance wheels, and flywheel pulleys mounted and revolving on crankshaft of engine or other shafting.

"Prime movers" include steam, gas, oil, and air engines, motors, steam and hydraulic turbines, and other equipment used as a source of power.

(1) Unless guarded by location, flywheels must be guarded according to the following requirements:

(a) Guard enclosures are made of sheet, perforated, or expanded metal, or woven wire.

(b) Guard rails are between 15 and 20 inches from the rim. When a flywheel extends into a pit or is within 12 inches of the floor, a standard toeboard is provided.

(c) When the upper rim of a flywheel extends through a working floor, it is surrounded by a guardrail and toeboard.

(d) Exception: When a flywheel with a smooth rim 5 feet or less in diameter cannot be guarded by the above methods, you must guard by meeting the following requirements:

On the exposed side, cover the flywheel spokes with a disk that makes a smooth surface and edge, and provides for inspection. You may leave an open space, less than 4 inches wide, between the outside edge of the disk and the rim of the wheel, to turn the wheel over. If you use a disk, keys or other projections left uncovered by the projections shall be cut off or covered.

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Note: This exception does not apply to flywheels with solid web centers.

(e) At the flywheel of a gas or oil engine, you may provide an adjustable guard for starting the engine or for running adjustment. A slot opening for a jack bar is permitted.

(f) For flywheels above working areas, you must install guards that are strong enough to hold the weight of the flywheel if the shaft or wheel mounting fails.

(2) Cranks and connecting rods, when exposed to contact, must be guarded according to WAC 296-307-28046 and 296-307-28048, or by a guardrail according to WAC 296-307-28060.

(3) Tail rods or extension piston rods must be guarded according to WAC 296-307-28046 and 296-307-28048, or by a guardrail on the sides and end, with a clearance of between 15 and 20 inches when rod is fully extended.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28014, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-28014, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28014, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28016 What requirements apply to guarding shafting? Revolving shafts must be guarded by a standard safeguard unless guarded by location.

(1) All shafting must be secured against excessive end movement.

(2) Guarding horizontal shafting.

(a) Unless guarded by location, all exposed parts of horizontal shafting, must be enclosed in a guard that covers the shafting completely or by a trough that covers the sides and top or sides and bottom of the shafting as location requires.

(b) Shafting under bench machines must be enclosed by a guard that covers the shafting completely or by a trough that covers the sides and top or sides and bottom of the shafting as location requires. The sides of the trough must extend to at least 6 inches from the underside of table. If shafting is near the floor, the trough must extend to at least 6 inches from the floor. In every case, the sides of trough must extend at least 2 inches beyond the shafting or projection.

Exception: Maintenance runways are exempt from this requirement. "Maintenance runway" means any permanent runway or platform used for oiling, maintenance, running adjustment, or repair work, but not for passage-way.

(3) Unless guarded by location, vertical and inclined shafting must be enclosed according to WAC 296-307-28046 and 296-307-28050 through 296-307-28060.

Exception: Maintenance runways are exempt from this requirement.

(4) Projecting shaft ends.

(a) Projecting shaft ends must have a smooth edge and end and must not project more than one-half the diameter of the shaft unless guarded by nonrotating caps or safety sleeves.

(b) Unused keyways must be filled up or covered.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28016, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-28016, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28016, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28018 What requirements apply to guarding pulleys? (1) Unless guarded by location, pulleys must be guarded according to WAC 296-307-28046 and 296-307-28050 through 296-307-28060. Pulleys serving as balance wheels (e.g., punch presses) on which the point of contact between belt and pulley is more than 6 feet 6 inches from the floor or platform may be guarded with a disk covering the spokes.

(2) If the distance to the nearest fixed pulley, clutch, or hanger is equal to or less than the width of the belt, then you must provide a guide to prevent the belt from leaving the pulley on the side where insufficient clearance exists.

(3) Where there are overhanging pulleys on line, jack, or countershafts with no bearing between the pulley and the outer end of the shaft, you should provide a guide to prevent the belt from running off the pulley.

(4) Pulleys with cracks, or pieces broken out of rims are prohibited.

(5) Pulleys must be designed and balanced for the operating speed.

(6) Composition or laminated wood pulleys must not be installed where they are likely to deteriorate.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28018, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-28018, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28018, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28020 What requirements apply to guarding horizontal belt, rope, and chain drives? "Belts" include all power transmission belts, such as flat belts, round belts, V-belts, etc., unless otherwise specified.

(1) Where both runs of horizontal belts are 7 feet or less from the floor level, the guard must extend to at least 15 inches above the belt or to a standard height. (See Table P-1.)

Exception: Where both runs of a horizontal belt are 42 inches or less from the floor, the belt must be fully enclosed according to WAC 296-307-28046 and 296-307-28050 through 296-307-28060.

(2) In power development rooms, a guardrail may be used instead of the guard.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28020, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-28020, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28020, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28022 What requirements apply to guarding overhead horizontal belt, rope, and chain drives? (1) Unless guarded by location, overhead horizontal belts must be guarded on the sides and bottom according to WAC 296-307-28054.

(2) Unless guarded by location, horizontal overhead belts must be guarded for their entire length when:

(a) Located over passageways or work places and traveling 1,800 feet or more per minute.

(b) The center to center distance between pulleys is 10 feet or more.

(c) The belt is 8 inches wide or more.

(3) Where the upper and lower runs of horizontal belts are located so that employees can pass between them, the passage must be either:

(a) Completely barred according to WAC 296-307-28046 and 296-307-28050 through 296-307-28060; or

(b) In a passage that employees must use, there must be a platform over the lower run guarded on either side by a railing that is completely filled in with wire mesh or other filler, or by a solid barrier. The upper run must be guarded to prevent contact by the employee or by objects carried by the employee.

(4) Overhead chain and link belt drives must be guarded according to the same requirements as overhead horizontal belts.

(5) American or continuous system rope drives located where the condition of the rope (particularly the splice) cannot be constantly and conveniently observed, must have an alarm (preferably electric-bell type) that will warn when the rope begins to fray.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28022, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-28022, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28022, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28024 What requirements apply to guarding vertical and inclined belts? (1) Vertical and inclined belts must be guarded according to WAC 296-307-28044 and 296-307-28050 through 296-307-28060.

(2) All guards for inclined belts must provide a minimum clearance of 7 feet between belt and floor at any point outside of the guard.

(3) A vertical or inclined belt may be guarded with a nip-point belt and pulley guard, if it is:

(a) 2-1/2 inches wide or less;

(b) Running at a speed of less than one thousand feet per minute; and

(c) Free from metal lacings or fastenings.

"Nip-point belt and pulley guard" means a device that encloses the pulley and has rounded or rolled edge slots through which the belt passes.

(4) Vertical belts running over a lower pulley more than seven feet above floor or platform must be guarded according to the same requirements as horizontal overhead belts, if the belt is:

(a) Located over passageways or work places and traveling 1,800 feet or more per minute;

(b) Eight inches wider or more.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28024, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-28024, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28024, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28026 What requirements apply to guarding cone-pulley belts? (1) The cone belt and pulley must have a belt shifter that adequately guards the nip point of the belt and pulley. If the frame of the belt shifter does not adequately guard the nip point of the belt and pulley, the nip point must be protected by a vertical guard in front of the pulley that extends at least to the top of the largest step of the cone.

"Belt shifter" means a device for mechanically shifting belts from tight to loose pulleys or vice versa, or for shifting belts on cones of speed pulleys.

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(2) If the belt is endless or laced with rawhide laces, and no belt shifter is used, the belt may be guarded according to the following:

(a) The nip point of the belt and pulley is protected by a nip point guard in front of the cone;

(b) The guard extends at least to the top of the largest step of the cone; and

(c) The guard is formed to show the contour of the cone.

(3) If the cone is less than 3 feet from the floor or working platform, the cone pulley and belt must be guarded to a height of 3 feet regardless of whether the belt is endless or laced with rawhide.

[Recodified as § 296-307-28026, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28026, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28028 What requirements apply to guarding belt tighteners? (1) Suspended counterbalanced belt tighteners and all components must be substantially constructed and securely fastened. The bearings must be securely capped. You must provide a mechanism to prevent the tightener from falling in case the belt breaks.

(2) Unless guarded by location, suspended counterweights must be encased to prevent accident.

(3) Belt tighteners used for starting and stopping machinery, unless held by gravity in the "off" or "out of service" position, must have a mechanism that will hold the belt tightener away from the belt when not in use. The mechanism must automatically grip, latch or otherwise fasten itself to and hold the belt tightener in "off" or "out of service" position until released by hand.

[Recodified as § 296-307-28028, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28028, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28030 What requirements apply to guarding gears, sprockets, and chains? (1) Gears must be guarded by one of the following methods:

(a) A complete enclosure; or

(b) A standard guard according to WAC 296-307-28050 through 296-307-28060, at least 7 feet high extending 6 inches above the mesh point of the gears; or

(c) A band guard covering the face of gear. The guard must have flanges extended inward beyond the root of the teeth on the exposed side or sides. If a part of the train of gears guarded by a band guard is less than 6 feet from the floor, the gear must be guarded by a disk guard or by a complete enclosure at least 6 feet tall.

(2) Hand-operated gears used only to adjust hand-powered machine parts may be unguarded. However, we recommend guarding these gears.

(3) Unless guarded by location, all sprocket wheels and chains must be enclosed. Where the drive extends over other machine or working areas, you must provide protection against falling parts.

Exception: This section does not apply to manually operated sprockets.

(4) When gears require frequent oiling, you must provide openings with hinged or sliding self-closing covers. All

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points not readily accessible must have oil feed tubes if lubricant is added while machinery is in motion.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28030, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-28030, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28030, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28032 What requirements apply to guarding friction drives? When exposed to contact, the driving point of all friction drives must be guarded. All arm or spoke friction drives and all web friction drives with holes in the web must be entirely enclosed. When exposed to contact, all projecting belts on friction drives must be guarded.

[Recodified as § 296-307-28032, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28032, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28034 What requirements apply to guarding keys, set screws, and other projections? (1) All projecting keys, set screws, and other projections in revolving parts must be removed, or made flush, or guarded by metal covers.

(2) Projections, such as exposed bolts, keys, or set screws that are part of sprockets, grooved pulleys or pulleys on stationary equipment must be shielded unless guarded by location.

Exception: This section does not apply to keys or set screws within gear or sprocket casings or other enclosures, nor to keys, set screws, or oilcups in hubs of pulleys less than 20 inches in diameter where they are within the plane of the rim of the pulley.

Note: We recommend that you not use projecting set screws or oilcups in any revolving pulley or part of machinery.

[Recodified as § 296-307-28034, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28034, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28036 What requirements apply to guarding collars and couplings? (1) All revolving collars, including split collars, must be cylindrical. Screws or bolts used in collars must not project beyond the largest periphery of the collar.

(2) Shaft couplings must be constructed to prevent hazard from bolts, nuts, set screws, or revolving surfaces. Bolts, nuts, and set screws are permitted where they are covered with safety sleeves or where they are used parallel with the shafting and are countersunk or where they do not extend beyond the flange of the coupling.

[Recodified as § 296-307-28036, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28036, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28038 Must self-lubricating bearings be used? We recommend that you use self-lubricating bearings. All drip cups and pans must be securely fastened.

[Recodified as § 296-307-28038, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28038, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28040 What requirements apply to guarding clutches, cutoff couplings, and clutch pulleys? (1) Unless guarded by location, clutches, cutoff couplings, or

clutch pulleys with projecting parts must be enclosed by a stationary guard constructed according to WAC 296-307-28046. You may use a "U" type guard.

(2) In engine rooms, a guardrail, preferably with toe-board, may be used instead of the guard if the room is only occupied by engine room attendants.

(3) A bearing support next to a friction clutch or cutoff coupling must have self-lubricating bearings that require infrequent maintenance.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28040, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-28040, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28040, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28042 What requirements apply to guarding belt shifters, clutches, shippers, poles, perches, and fasteners? "Belt pole" (sometimes called a "belt shipper" or "shipper pole") means a device used in shifting belts on and off fixed pulleys on line or countershaft where there are no loose pulleys.

(1) Tight and loose pulleys must have a permanent belt shifter with a mechanical means to prevent the belt from creeping from loose to tight pulley.

(2) Belt shifter and clutch handles must be rounded. They must be as far as possible from danger of accidental contact, but within easy reach of the operator. Where belt shifters are not directly over a machine or bench, the handles must be cut off 6 feet 6 inches above floor level.

(3) All belt and clutch shifters of the same type in each shop should move in the same direction to stop machines, i.e., either all right or all left.

Exception: This requirement does not apply to a friction clutch on a countershaft carrying two clutch pulleys with open and crossed belts. In this case the shifter handle has three positions and the machine is at a standstill when the clutch handle is in the neutral or center position.

(4) When belt poles must be used as a substitute for mechanical shifters, they must be big enough for employees to grasp them securely. Poles must be smooth and preferably of straight grain hardwood, such as ash or hickory. The edges of rectangular poles should be rounded. Poles should extend from the top of the pulley to within approximately 40 inches of the floor or working platform.

(5) Where loose pulleys or idlers are not practical, belt perches such as brackets, rollers, etc., must be used to keep idle belts away from the shafts. Perches should be substantial and designed for safe belt shifting.

(6) Belts that must be shifted by hand and belts within seven feet of the floor or working platform that are not guarded according to WAC 296-307-28046 must not be fastened with metal, nor with any other fastening that creates a hazard.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28042, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-28042, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28042, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28044 What materials must be used for standard guards? (1) Standard guards must be made of the following materials:

- (a) Expanded metal;
- (b) Perforated or solid sheet metal;
- (c) Wire mesh on a frame of angle iron; or
- (d) Iron pipe securely fastened to the floor or the frame of the machine.

(2) Wire mesh should have wires that are securely fastened at every cross point either by welding, soldering, or galvanizing.

Exception: Diamond or square wire mesh made of No. 14 gauge wire, 3/4-inch mesh or heavier is exempt from this requirement.

[Recodified as § 296-307-28044. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28044, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28046 How must standard guards be manufactured? (1) Guards must be free from burrs, sharp edges, and sharp corners.

(2) Expanded metal, sheet or perforated metal, and wire mesh must be securely fastened to the frame by one of the following methods:

(a) Rivets or bolts spaced not more than five inches center to center. In case of expanded metal or wire mesh, metal strips or clips must be used to form a washer for rivets or bolts.

(b) Welding to frame every four inches.

(c) Weaving through channel or angle frame, or, if No. 14 gauge 3/4-inch mesh or heavier is used, by bending entirely around rod frames.

(d) To fill openings in pipe railing with expanded metal, wire mesh, or sheet metal, make the filler material into panels with rolled edges or edges bound with "V" or "U" edging. The edging must be of at least No. 24 gauge sheet metal fastened to the panels with bolts or rivets spaced a maximum of 5 inches center to center. The bound panels must be fastened to the railing by sheet-metal clips spaced a maximum of 5 inches center to center.

(e) Diamond or square mesh made of crimped wire fastened into channels, angle iron, or round-iron frames may also be used as a filler in guards. Size of mesh must correspond to Table P-1.

(3) Where guard design requires filler material greater than 12 square feet, additional frame members must be provided to ensure that the panel area is a maximum of 12 square feet.

(4) All joints of framework must be as strong as the material of the frame.

[Recodified as § 296-307-28046. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28046, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28048 What requirements apply to disk, shield, and U-guards? (1) A disk guard must have a sheet-metal disk of at least No. 22 gauge fastened by U-bolts or rivets to the spokes of pulleys, flywheels, or gears. To prevent contact with sharp edges of the disk, the edge must be rolled or wired. In all cases, the nuts must have locknuts on the unexposed side of the wheel.

(2) A shield guard must have a frame filled in with wire mesh or expanded, perforated, or solid sheet metal.

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(3) If the shield area is less than six square feet, the wire mesh or expanded metal may be fastened in a framework of 3/8-inch solid rod, 3/4-inch by 3/4-inch by 1/8-inch angle iron, or a metal construction of equivalent strength. Metal shields may have edges entirely rolled around a 3/8-inch solid iron rod.

(4) A U-guard consisting of a flat surface with edge members must cover the under surface and lower edge of a belt, multiple chain, or rope drive. It must be constructed of materials specified in Table P-1, and must meet the requirements of WAC 296-307-28054 through 296-307-28058. Edges must be smooth and, if the size of the guard requires, be reinforced by rolling, wiring, or by binding with angle or flat iron.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-28048, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-28048. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28048, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28050 What materials must be used for guards? The materials and dimensions specified in this section apply to all guards. The materials and dimensions specified are minimum requirements. You may choose to provide stronger guards.

Exception: Horizontal overhead belts, rope, cable, or chain guards more than 7 feet above floor, or platform must meet the requirements outlined in Table P-2.

(1) The framework of all guards must have minimum dimensions of 1-inch by 1-inch by 1/8-inch for angle iron, 3/4-inch inside diameter for metal pipe, or metal construction of equivalent strength.

Exception: Guards thirty inches tall or less with a total surface area of ten square feet or less may have a framework of 3/8-inch solid rod, 3/4-inch by 3/4-inch by 1/8-inch angle iron, or metal construction of equivalent strength. The filling material must correspond to the requirements of Table 1.

(a) All guards must be rigidly braced every 3 feet of their height to some fixed part of machinery or building structure. Where a guard is exposed to contact with moving equipment additional strength may be necessary.

(b) The framework for all guards fastened to the floor or working platform and without other support or bracing must consist of 1-1/2-inch by 1-1/2-inch by 1/8-inch angle iron, metal pipe of 1-1/2-inch inside diameter, or metal construction of equivalent strength. All rectangular guards must have at least four upright frame members that extend to the floor and are securely fastened. Cylindrical guards must have at least three supporting members that extend to the floor.

(2) Where guards are exposed to unusual wear, deterioration, or impact, heavier material and construction should be used to protect against the specific hazards involved.

[Recodified as § 296-307-28050. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-28050, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28052 When may wood guards be used? Wood guards may be used where fumes would cause rapid deterioration of metal guards and outdoors where extreme cold or extreme heat make metal guards and railings undesirable.

- (1) Wood must be sound, tough, and without loose knots.
- (2) Guards must be made of planed lumber not less than 1-inch rough board measure, with rounded edges and corners.
- (3) Wood guards must be securely fastened together with wood screws, hardwood dowel pins, bolts, or rivets.
- (4) Wood guards must be equal in strength and rigidity to metal guards specified in WAC 296-307-28050 and Table P-1.

Note: Requirements for the construction of standard wood railings are in WAC 296-307-28060.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28052, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-28052, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28052, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28054 What materials may be used for guarding horizontal overhead belts? (1) Guards for horizontal overhead belts must run the entire length of the belt and follow the line of the pulley to the ceiling or extend to the nearest wall.

Exception: Where belts are located so that it is impractical to extend the guard to wall or ceiling, the guard must completely enclose the top and bottom runs of the belt and the face of pulleys.

(2) The guard and its supporting parts must be securely fastened to the wall or ceiling by gimlet-point lag screws or through bolts. In masonry, expansion bolts must be used. We recommend using bolts placed horizontally through floor beams or ceiling rafters.

(3) When necessary, suitable reinforcement must be provided for the ceiling rafters or overhead floor beams to sustain safely the weight and stress imposed by the guard.

(4) The interior surface of all guards must be smooth and free from projections.

Exception: Where construction demands it, protruding shallow roundhead rivets may be used.

[Recodified as § 296-307-28054, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28054, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28056 What clearance must be maintained between guards and power transmission machinery? (1) Overhead belt guards must be at least one-quarter wider than the belt they protect, with a maximum clearance of 6 inches on each side. Overhead rope-drive and block and roller-chain-drive guards must be at least six inches wider than the drive on each side.

(2) Overhead silent chain-drive guards with the chain held on sprockets must have side clearance of:

- (a) On drives of 20-inch centers or less, at least 1/4-inch from the nearest moving chain part, and
- (b) On drives of over 20-inch centers, a minimum of 1/2-inch from the nearest moving chain part.

(3) Table 2 gives the sizes of materials and construction specifications for guards for belts that are 10 inches wide or more. All materials for overhead belt guards must be at least the size specified in Table 2 for belts 10 to 14 inches wide, even if the overhead belt is less than 10 inches wide. However, No. 20 gauge sheet metal may be used as a filler on guards for belts less than 10 inches wide. Expanded metal,

because of the sharp edges, should not be used as a filler in horizontal belt guards.

(4) For clearance between guards and belts, ropes, or chains see Table P-2.

[Recodified as § 296-307-28056, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28056, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28058 How must overhead rope and chain-drive guards be constructed? (1) Overhead-rope and chain-drive guard construction must meet the requirements for overhead-belt guard construction of similar width.

Exception: The filler material must be solid, according to Table P-2, unless fire hazard demands the use of open construction.

(2) A side guard member of the same solid filling material should extend 2 inches above the level of the lower run of the rope or chain drive and 2 inches within the periphery of the pulleys that the guard encloses, forming a trough.

(3) The side filler members should be reinforced on the edges with 1-1/2-inch by 1/4-inch flat steel, riveted to the filling material at 8 inch centers or less. The reinforcing strip should be fastened or bolted to all guard supporting members with at least one 3/8-inch rivet or bolt at each intersection, and the ends should be secured to the ceiling with lag screws or bolts.

(4) The filling material must be fastened to the framework of the guard and the filler supports by 3/16-inch rivets spaced on 4-inch centers. Measure the width of a multiple drive from the outside of the first to the outside of the last rope or chain in the group accommodated by the pulley.

[Recodified as § 296-307-28058, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28058, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28060 What materials must be used for guardrails and toeboards? (1) A guardrail used to guard power transmission parts must be 42 inches tall, with a midrail between the top rail and the floor.

(2) Posts must be 8 feet apart or less. They must be permanent and substantial, smooth, and free from protruding nails, bolts, and splinters. If made of pipe, the post must be at least 1-1/4 inches inside diameter. If posts are made of metal shapes or bars, the section must be as strong as posts made of 1-1/2 by 1-1/2 by 3/16-inch angle iron. If posts are made of wood, the posts must be at least 2 by 4 inches. The upper rail must be 2 by 4 inches, or two 1 by 4 inch strips, one at the top and one at the side of the posts. The midrail must be at least 1 by 4 inches.

(3) The rails (metal shapes, metal bars, or wood), should be on the side of the posts that gives the best protection and support. Where panels are fitted with expanded metal or wire mesh (as noted in Table 1) the middle rails may be omitted. Where guard is exposed to contact with moving equipment, additional strength may be necessary.

(4) Toeboards must be at least 4 inches tall, of wood, metal, or metal grill of a maximum 1-inch mesh. Toeboards at flywheel pits should be placed as close to edge of the pit as possible.

Table P-1
TABLE OF STANDARD MATERIALS AND DIMENSIONS

Material	Clearance from moving part at all points (inches)	Largest mesh or opening allowable (inches)	Minimum gauge (U.S. Standard) or thickness (inches)	Minimum height of guard from floor or platform level (feet)
<i>Woven wire</i>	Under 2	3/8	No. 16	7
	2-4	1/2	No. 16	7
	Under 4	1/2	No. 16	7
	4-15	2	No. 12	7
<i>Expanded metal</i>	Under 4	1/2	No. 18	7
	4-15	2	No. 13	7
<i>Perforated metal</i>	Under 4	1/2	No. 20	7
	4-15	2	No. 14	7
<i>Sheet metal</i>	Under 4		No. 22	7
	4-15		No. 22	7
<i>Wood or metal strip crossed</i>	Under 4	3/8	Wood 3/4 Metal No. 16	7
	4-15	2	Wood 3/4 Metal No. 16	7
<i>Wood or metal strip not crossed</i>	Under 4	1/2 width	Wood 3/4 Metal No. 16	7
	4-15	1 width	Wood 3/4 Metal No. 16	7
<i>Standard rail</i>	Min. 15 Max. 20			

Table P-2
HORIZONTAL OVERHEAD BELTS, ROPES, AND CHAINS
7 FEET OR MORE ABOVE FLOOR OR PLATFORM

	Width 0"-14" inclusive	Material
MEMBERS		
Framework	1 1/2"x1 1/2"x1/4"	Angle iron
Filler (belt guards)	1 1/2"x3/16"	Flat iron
Filler and vertical side member	No. 20 A.W.G.	Solid sheet metal
Filler supports	2"x5/16" flat iron	Flat and angle
Guard supports	2"x5/16"	Flat iron
FASTENINGS		
Filler supports to framework	(2) 3/16"	Rivets
Filler flats to supports (belt guards)	(1) 5/16"	Flush rivets
Filler to frame and supports (chain guards)	3/16"	Rivets spaced
Guard supports to framework	(2) 3/6"	Rivets or bolts
Guard and supports to overhead ceiling	1/4"x3 1/2" lag screws or 1/2" bolts	Lag screws or bolts
DETAILS—SPACING, ETC.		
Width of guards	One-quarter wider than belt, rope, or chain drive	
Spacing between filler supports	20" center to center	
Spacing between filler flats (belt guards)	2" apart	
Spacing between guard supports	36" center to center	
OTHER BELT GUARD FILLING PERMITTED		
Sheet metal fastened as in chain guards	No. 20 A.W.G.	Solid or perforated
Woven wire, 2" mesh	No. 12 A.W.G.	
CLEARANCE FROM OUTSIDE OF BELT, ROPE, OR CHAIN DRIVE TO GUARD		
Distance center to center of shafts	Up to 15' inclusive	Over 40'
Clearance from belt, or chain to guard	16"	120"

	Width over 14" to 24" inclusive	Material
MEMBERS		
Framework	2"x2"x5/16"	Angle iron
Filler (belt guards)	2"x3/16"	Flat iron
Filler and vertical side member	No. 18 A.W.G.	Solid sheet metal
Filler supports	2"x3/8" flat iron	Flat and angle
Guard supports	2"x3/8"	Flat iron
FASTENINGS		
Filler supports to framework	(2) 3/6"	Rivets
Filler flats to supports (belt guards)	(1) 5/16"	Flush rivets
Filler to frame and supports (chain guards)	8" centers on sides and 4" centers on bottom	
Guard supports to framework	(2) 7/16"	Rivets or bolts
Guard and supports to overhead ceiling	5/8"x4" lag screws or 5/8" bolts	Lag screws or bolts
DETAILS—SPACING, ETC.		
Width of guards		
Spacing between filler supports		16" C. to C
Spacing between filler flats (belt guards)		2 1/2" apart
Spacing between guard supports		36" C. to C
OTHER BELT GUARD FILLING PERMITTED		
Sheet metal fastened as in chain guards	No. 18 A.W.G.	Solid or perforated
Woven wire, 2" mesh	No. 10 A.W.G.	
CLEARANCE FROM OUTSIDE OF BELT, ROPE, OR CHAIN DRIVE TO GUARD		
Distance center to center of shafts	Over 15' to 25'	Over 40' inclusive
Clearance from belt/chain to guard	10"	20"
	Width over 24"	Material
MEMBERS		
Framework	3"x3"x3/8"	Angle iron
Filler (belt guards)	2"x5/16"	Flat iron
Filler and vertical side member	No. A.W.G.	Solid sheet metal
Filler supports	2 1/2"x2 1/2"x1/4" angle	Flat and angle
Guard supports	2 1/2"x3/8"	Flat iron
FASTENINGS		
Filler supports to framework	(3) 1/2"	Rivets
Filler flats to supports (belt guards)	(2) 3/8"	Flush rivets
Filler to frame and supports (chain guards)		
Guard supports to frame work	(2) 5/8"	Rivets or bolts
Guard and supports to overhead ceiling	3/4" x 6" lag screws or 3/4" bolt	Lag screws or bolts
DETAILS—SPACING, ETC.		
Width of guards		
Spacing between filler supports		16" C. to C.
Spacing between filler flats (belt guards)		4" apart
Spacing between guard supports		36" C. to C.
OTHER BELT GUARD FILLING PERMITTED		
Sheet metal fastened as in chain guards	No. 18 A.W.G.	Solid or perforated
Woven wire, 2" mesh	No. 8 A.W.G.	
CLEARANCE FROM OUTSIDE OF BELT, ROPE, OR CHAIN DRIVE TO GUARD		
Distance center to center of shafts	Over 25' to 40' inclusive	Over 40'
Clearance from belt, or chain to guard	15"	20"

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-28060, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-28060, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28060, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28062 How must shafting be maintained? (1) Shafting must be kept in alignment, and free from rust and excess oil or grease.

(2) Where explosives, explosive dusts, flammable vapors or flammable liquids exist, guards must take into account the hazard of static sparks from shafting.

[Recodified as § 296-307-28062, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28062, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28064 How must pulleys be maintained? (1) Pulleys must be kept in proper alignment to prevent belts from running off.

(2) Any pulley carrying a nonshifting belt should have a crowned face.

(3) Cast-iron pulleys should be tested frequently with a hammer to detect cracks in rim or spokes. The sound is different depending on whether the belt is or is not on the pulley.

(4) Split pulleys should be inspected to be sure that all bolts holding together the sections of the pulley are tight.

[Recodified as § 296-307-28064, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28064, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28066 How must belts be maintained? (1) Quarter-twist belts without an idler can be used on drives running in one direction only. They will run off a pulley when direction is reversed.

(2) You must inspect belts, lacings, and fasteners to be sure they are kept in good repair.

(3) Dressing should not be applied when the belt or rope is in motion; but, when necessary, it should be applied where belts or rope leave the pulley, not where they approach. The same precautions apply to lubricating chains. In the case of V-belts, belt dressing is neither necessary nor advisable.

[Recodified as § 296-307-28066, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28066, filed 10/31/96, effective 12/1/96.]

WAC 296-307-28068 How must other equipment be maintained? (1) You must inspect all power-transmission equipment at least every 60 days and ensure that it is kept in good working condition at all times.

(2) Bearings must be kept in alignment and properly adjusted.

(3) Hangers must be inspected to ensure that all supporting bolts and screws are tight and that supports of hanger boxes are adjusted properly.

(4) The oilers must wear tightfitting clothing and should use cans with long spouts to keep their hands out of danger. Machinery must be oiled when not in motion, wherever possible.

[Recodified as § 296-307-28068, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-28068, filed 10/31/96, effective 12/1/96.]

WAC 296-307-290 Auger conveying equipment.

(1999 Ed.)

[Recodified as § 296-307-290, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-290, filed 10/31/96, effective 12/1/96.]

WAC 296-307-29005 What requirements apply to auger conveying equipment? "Augers" means screw conveyors and related accessories designed primarily for conveying agricultural materials on farms.

(1) Power take-off shafts must be guarded according to WAC 296-307-28046.

(2) All augers must be covered or guarded when exposed to contact.

(3) You must ensure that each sweep auger has its top half shielded by a guard. All guard openings must be no larger than 4 3/4 inches across.

(4) You must ensure that the exposed auger at the hopper and the intake is guarded or designed to prevent accidental contact with the rotating inlet area. The guard must extend at least 2 1/2 inches above and below the exposed auger. Openings in the guard, for the free flow of material, must be no larger than 4 3/4 inches across and must be strong enough to support 250 pounds at mid span.

(5) The hand raising winch must have a control that will hold the auger at any angle, and that will only respond to the control. You must ensure that the operator is able to lower the auger without disengaging the control. The maximum force required on the handle to raise or lower the auger manually must be 50 pounds.

(6) The wire rope lifting pulleys must be grooved to fit the wire rope used.

(7) In order to avoid separation, you must provide a positive restraint between the auger tube and the under-carriage lifting arm. You must provide stops that restrict the maximum raised angle and minimum lowered angle.

(8) Wire ropes (cables) must be rust resistant and selected for the design load and service intended.

(9) You must provide the auger operator with service and operation instructions that include safe operation and servicing practices.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-29005, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-29005, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-29005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-29010 What other requirements apply to auger conveying equipment manufactured after October 25, 1976? You must ensure that auger conveying equipment manufactured after October 25, 1976, is guarded as follows:

(1) Sweep-arm material-gathering mechanisms used on the top surface of materials within silo structures are guarded. The lower or leading edge of the guard is no more than 12 inches above the material surface and no less than 6 inches in front of the leading edge of the rotating member of the gathering mechanism. The guard is parallel to and extends the fullest practical length of the material gathering mechanism.

(2) Exposed auger flighting on portable grain augers is guarded with either grating type guards or solid baffle style covers as follows:

(a) The largest dimensions or openings in grating type guards through which materials flow is 4-3/4 inches. The

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opening area is a maximum of 10 square inches. The opening is least 2-1/2 inches from the rotating flighting.

(b) Slotted openings in solid baffle style covers are a maximum of 1-1/2 inches wide, or less than 3-1/2 inches from the exposed flighting.

[Recodified as § 296-307-29010. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-29010, filed 10/31/96, effective 12/1/96.]

WAC 296-307-300 Guarding farmstead equipment.

[Recodified as § 296-307-300. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-300, filed 10/31/96, effective 12/1/96.]

WAC 296-307-30003 What does this section cover?

WAC 296-307-300 applies to the guarding and care of farmstead equipment.

"Farmstead equipment" means agricultural equipment normally used in a stationary manner. This includes, but is not limited to, materials handling equipment and accessories for such equipment whether or not the equipment is an integral part of a building.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-30003, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-30003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-30003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-30006 How must power takeoff shafts of farmstead equipment be guarded? (1) You must ensure that all power takeoff shafts, including rear-mounted, mid-mounted or side-mounted shafts, are guarded either by a master shield or by other protective guarding. The master shield must be strong enough to prevent damaging the shield when a 250-pound operator mounts or dismounts the tractor using the shield as a step.

(2) Power takeoff driven equipment must be guarded to prevent employee contact with rotating parts of the power drive system. Where power takeoff driven equipment requires removal of the tractor master shield, the equipment must also include protection from any portion of the tractor power takeoff shaft that protrudes from the tractor.

(3) Signs must be placed at prominent locations on power takeoff driven equipment specifying that power drive system safety shields must be kept in place.

[Recodified as § 296-307-30006. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-30006, filed 10/31/96, effective 12/1/96.]

WAC 296-307-30009 How must other power transmission components of farmstead equipment be guarded?

(1) All power transmission parts must be guarded according to WAC 296-307-280.

(2) Smooth shafts and shaft ends (without any projecting bolts, keys, or set screws) may be unguarded if they:

- (a) Revolve at less than 10 RPM; and
- (b) Are part of feed handling equipment used on the top surface of materials in bulk storage facilities.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-30009, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-30009. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-30009, filed 10/31/96, effective 12/1/96.]

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WAC 296-307-30012 How must functional components of farmstead equipment be guarded? The following functional components must be shielded to a degree consistent with the intended function and operator's vision of the component:

- Snapping or husking rolls;
- Straw spreaders and choppers;
- Cutterbars;
- Flail rotors;
- Rotary beaters;
- Mixing augers;
- Feed rolls;
- Rotary tillers; and
- Similar units that must be exposed for proper function.

[Recodified as § 296-307-30012. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-30012, filed 10/31/96, effective 12/1/96.]

WAC 296-307-30015 When may guards be removed on farmstead equipment? (1) Guards, shields and access doors must be in place when the equipment is in operation.

(2) Where removal of a guard or access door will expose an employee to any component that continues to rotate after the power is disengaged, you must provide in the immediate area, a safety sign warning the employee:

- (a) To look and listen for evidence of rotation; and
- (b) To refrain from removing the guard or access door until all components have stopped.

(3) On equipment manufactured after October 25, 1976, a readily visible or audible warning of rotation is required.

[Recodified as § 296-307-30015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-30015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-30018 What requirements apply to electrical control for maintaining and servicing farmstead equipment? (1) You must ensure that only the employee maintaining or servicing equipment has control of the electrical power source by:

(a) Providing an exclusive, positive locking means on the main switch that can be operated only by the employee performing the maintenance or service; or

(b) For material handling equipment in a bulk storage structure, by providing on the equipment an electrical or mechanical means to disconnect the power. Minimum lock-out means must meet the requirements of WAC 296-307-320.

(2) All circuit protection devices, including those that are an integral part of a motor, must have a manual reset, except where:

(a) A manual reset is infeasible because of the nature of the operation, distances involved, and the amount of time normally spent by employees in the area of the affected equipment;

(b) An electrical disconnect switch is available to the employee within fifteen feet of the equipment being maintained or serviced; and

(c) A sign, prominently posted near each hazardous component, warns the employee that unless the electrical disconnect switch is utilized, the motor could automatically reset while the employee is working on the hazardous component.

(1999 Ed.)

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-30018, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-30018, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-30018, filed 10/31/96, effective 12/1/96.]

WAC 296-307-30021 What additional guarding requirements apply to farmstead equipment? (1) You must ensure that carton or bag stitching machines are properly safeguarded to prevent anyone from coming in contact with the stitching head and other pinch or nip points.

(2) The point of operation of all machines must be guarded. The guard must be designed and constructed to prevent the operator from having any part of the body in the danger zone during the operating cycle.

Note: The distance from the point-of-operation guards to the danger line depends on the size of the opening. The required distances are outlined in the table below:

Guarding line or distance of opening from point of operation hazard (inches)	Maximum width of opening (inches)
1/2 to 1 1/2	1/4
1 1/2 to 2 1/2	3/8
2 1/2 to 3 1/2	1/2
3 1/2 to 5 1/2	5/8
5 1/2 to 6 1/2	3/4
6 1/2 to 7 1/2	7/8
7 1/2 to 12 1/2	1 1/4
12 1/2 to 15 1/2	1 1/2
15 1/2 to 17 1/2	1 7/8
17 1/2 to 31 1/2	2 1/8

[Recodified as § 296-307-30021, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-30021, filed 10/31/96, effective 12/1/96.]

**Part Q
Control of Hazardous
Energy (Lockout-tagout)**

WAC 296-307-320 Control of hazardous energy (lockout-tagout).

[Recodified as § 296-307-320, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-320, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32001 What does this section cover? (1) WAC 296-307-320 covers the servicing and maintenance of machines and equipment in which the unexpected start up of the machine or equipment or release of stored energy could cause injury to employees. This standard establishes minimum performance requirements for the control of such hazardous energy.

(2) Normal production operations are not covered by this standard. Servicing and/or maintenance that takes place during normal production operations is covered by this standard only if:

(a) An employee is required to remove or bypass a guard or other safety device; or

(1999 Ed.)

(b) An employee is required to place a body part into a point of operation or where an associated danger zone exists during a machine operating cycle.

Exception: Minor servicing activities, that take place during normal production operations, are not covered by this standard if they are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures that provide effective protection.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-32001, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-32001, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 97-08-051A, § 296-306A-32001, filed 3/31/97, effective 5/1/97; 96-22-048, § 296-306A-32001, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32003 When does this section not apply? (1) WAC 296-307-320 does not apply to work on cord and plug connected electric equipment when:

(a) Unexpected energization or start up of the equipment is controlled by unplugging the equipment from the energy source; and

(b) The plug is under the exclusive control of the employee performing the servicing or maintenance.

(2) WAC 296-307-320 does not apply to hot tap operations involving transmission and distribution systems for substances such as gas, steam, water, or petroleum products when they are performed on pressurized pipelines, when:

(a) Continuity of service is essential;

(b) Shutdown of the system is impractical; and

(c) Documented procedures are followed, and special equipment is used that will provide proven effective protection for employees.

(3) WAC 296-307-320 does not cover exposure to electrical hazards from work on, near, or with conductors or equipment in electric utilization installations. These hazards are covered in chapter 296-307 WAC Part T.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-32003, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-32003, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-32003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32005 What definitions apply to this section? "Affected employee" means an employee who uses a machine or equipment while it is serviced or maintained under lockout or tagout, or who works where such servicing or maintenance is being performed.

"Authorized employee" means a person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this part.

"Capable of being locked out" means an energy isolating device that has a hasp or other means for a lock to be affixed, or has a locking mechanism built into it. It also means that the device can be locked out without dismantling, rebuilding, or replacing the energy isolating device or permanently altering its energy control capability.

"Energized" means connected to an energy source or containing residual or stored energy.

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[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-30018, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-30018, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-30018, filed 10/31/96, effective 12/1/96.]

WAC 296-307-30021 What additional guarding requirements apply to farmstead equipment? (1) You must ensure that carton or bag stitching machines are properly safeguarded to prevent anyone from coming in contact with the stitching head and other pinch or nip points.

(2) The point of operation of all machines must be guarded. The guard must be designed and constructed to prevent the operator from having any part of the body in the danger zone during the operating cycle.

Note: The distance from the point-of-operation guards to the danger line depends on the size of the opening. The required distances are outlined in the table below:

Guarding line or distance of opening from point of operation hazard (inches)	Maximum width of opening (inches)
1/2 to 1 1/2	1/4
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5 1/2 to 6 1/2	3/4
6 1/2 to 7 1/2	7/8
7 1/2 to 12 1/2	1 1/4
12 1/2 to 15 1/2	1 1/2
15 1/2 to 17 1/2	1 7/8
17 1/2 to 31 1/2	2 1/8

[Recodified as § 296-307-30021, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-30021, filed 10/31/96, effective 12/1/96.]

**Part Q
Control of Hazardous
Energy (Lockout-tagout)**

WAC 296-307-320 Control of hazardous energy (lockout-tagout).

[Recodified as § 296-307-320, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-320, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32001 What does this section cover? (1) WAC 296-307-320 covers the servicing and maintenance of machines and equipment in which the unexpected start up of the machine or equipment or release of stored energy could cause injury to employees. This standard establishes minimum performance requirements for the control of such hazardous energy.

(2) Normal production operations are not covered by this standard. Servicing and/or maintenance that takes place during normal production operations is covered by this standard only if:

(a) An employee is required to remove or bypass a guard or other safety device; or

(1999 Ed.)

(b) An employee is required to place a body part into a point of operation or where an associated danger zone exists during a machine operating cycle.

Exception: Minor servicing activities, that take place during normal production operations, are not covered by this standard if they are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures that provide effective protection.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-32001, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-32001, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 97-08-051A, § 296-306A-32001, filed 3/31/97, effective 5/1/97; 96-22-048, § 296-306A-32001, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32003 When does this section not apply? (1) WAC 296-307-320 does not apply to work on cord and plug connected electric equipment when:

(a) Unexpected energization or start up of the equipment is controlled by unplugging the equipment from the energy source; and

(b) The plug is under the exclusive control of the employee performing the servicing or maintenance.

(2) WAC 296-307-320 does not apply to hot tap operations involving transmission and distribution systems for substances such as gas, steam, water, or petroleum products when they are performed on pressurized pipelines, when:

(a) Continuity of service is essential;

(b) Shutdown of the system is impractical; and

(c) Documented procedures are followed, and special equipment is used that will provide proven effective protection for employees.

(3) WAC 296-307-320 does not cover exposure to electrical hazards from work on, near, or with conductors or equipment in electric utilization installations. These hazards are covered in chapter 296-307 WAC Part T.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-32003, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-32003, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-32003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32005 What definitions apply to this section? "Affected employee" means an employee who uses a machine or equipment while it is serviced or maintained under lockout or tagout, or who works where such servicing or maintenance is being performed.

"Authorized employee" means a person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this part.

"Capable of being locked out" means an energy isolating device that has a hasp or other means for a lock to be affixed, or has a locking mechanism built into it. It also means that the device can be locked out without dismantling, rebuilding, or replacing the energy isolating device or permanently altering its energy control capability.

"Energized" means connected to an energy source or containing residual or stored energy.

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"Energy isolating device" means a mechanical device that physically prevents the transmission or release of energy, including but not limited to the following:

- A manually operated electrical circuit breaker;
- A disconnect switch;
- A manually operated switch with conductors of circuit that can be disconnected from all ungrounded supply conductors and allows no pole to operate independently;
- A line valve;
- A block; and
- Any similar device used to block or isolate energy.

Push buttons, selector switches, and other control circuit devices are not energy isolating devices.

"Energy source" means any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy, including gravity.

"Hot tap" means a procedure used in repair, maintenance, and service activities that involves welding on a piece of equipment (pipelines, vessels, or tanks) under pressure, in order to install connections or accessories. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

"Lockout" means placing a lockout device on an energy isolating device, in accordance with an established procedure, to ensure that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

"Lockout device" means a device with a positive means such as a lock (key or combination type) to hold an energy isolating device in the safe position and prevents the energizing of a machine or equipment. Blank flanges and bolted slip blinds are included.

"Normal production operations" means using a machine or equipment for its intended production function.

"Servicing and/or maintenance" means workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning, or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or start up of the equipment or release of hazardous energy.

"Setting up" means any work performed to prepare a machine or equipment to perform its normal production operation.

"Tagout" means placing a tagout device on an energy isolating device, according to an established procedure, to indicate that the energy isolating device and the equipment being controlled must not be operated until the tagout device is removed.

"Tagout device" means a prominent warning device, such as a tag and attachment, that can be securely fastened to an energy isolating device according to an established procedure, to indicate that the energy isolating device and the equipment being controlled must not be operated until the tagout device is removed.

[Recodified as § 296-307-32005. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32005, filed 10/31/96, effective 12/1/96.]

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WAC 296-307-32007 What are the required elements of an energy control program? You must establish a written energy control program consisting of:

- An energy control procedure;
- Employee training; and
- Periodic inspections.

The purpose of the program is to ensure that before any employee services or maintains a machine or equipment where the unexpected energizing, start up, or release of stored energy could occur and cause injury, the machine or equipment is isolated from the energy source, and rendered inoperative.

[Recodified as § 296-307-32007. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32007, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32009 How does an employer determine when to use lockout vs. tagout? (1) If an energy isolating device is not capable of being locked out, your energy control program must use a tagout system.

(2) If an energy isolating device is capable of being locked out, your energy control program must use lockout unless a tagout system will provide full employee protection according to WAC 296-307-32011.

(3) Whenever major replacement or major repair, renovation, or modification of a machine or equipment is performed, and whenever new machines or equipment are installed, energy isolating devices for such machines or equipment must be designed to accept a lockout device.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-32009, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-32009. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32011 What requirements must be met to substitute tagout for lockout? (1) You must ensure that when a tagout device is used on an energy isolating device that is capable of being locked out, the tagout device is attached at the same location that the lockout device would have been attached. You must also ensure that the tagout program will provide safety that is equivalent to a lockout program.

(2) To demonstrate that a tagout program provides safety that is equivalent to a lockout program, you must demonstrate full compliance with all tagout requirements and any other measures necessary to provide equivalent safety. Other measures include:

- (a) Implementing additional safety measures such as the removal of an isolating circuit element;
- (b) Blocking a controlling switch;
- (c) Opening an extra disconnecting device; or
- (d) Removing a valve handle to reduce the likelihood of inadvertent energization.

[Recodified as § 296-307-32011. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32011, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32013 What are the required elements of energy control procedures? (1) You must develop, document, and use procedures to control potentially hazardous

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energy when employees are engaged in activities covered by this section.

Exception:

You are exempt from documenting procedures for a particular machine or equipment only when all of the following elements exist:

- (a) The machine or equipment has no potential for stored or residual energy or reaccumulation of stored energy after shut down that could endanger employees;
- (b) The machine or equipment has a single energy source that can be readily identified and isolated;
- (c) The isolation and locking out of that energy source will completely deenergize and deactivate the machine or equipment;
- (d) The machine or equipment is isolated from that energy source and locked out during servicing or maintenance;
- (e) A single lockout device will achieve lockout;
- (f) The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance;
- (g) The servicing or maintenance does not create hazards for other employees; and
- (h) The worksite has experienced no accidents involving the unexpected activation or reenergization of the machine or equipment during servicing or maintenance.

(2) The procedures must clearly and specifically outline the scope, purpose, authorization, rules, and techniques for the control of hazardous energy, and the means to enforce compliance including, but not limited to, the following:

- (a) A specific statement of the intended use of the procedure;
- (b) Specific procedural steps for shutting down, isolating, blocking, and securing machines or equipment to control hazardous energy;
- (c) Specific procedural steps for the placement, removal, and transfer of lockout devices or tagout devices and the responsibility for them; and
- (d) Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

[Recodified as § 296-307-32013, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32013, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32015 What requirements apply to lockout and tagout devices and materials? (1) You must provide locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware for isolating, securing, or blocking machines or equipment from energy sources.

(2) Lockout and tagout devices must be singularly identified; must be the only device(s) used for controlling energy; must not be used for other purposes.

(3) Lockout and tagout devices must be durable and meet the following requirements:

(a) Lockout and tagout devices must be able to withstand the environment to which they are exposed for the maximum period of time that exposure is expected.

(b) Tagout devices must be constructed and printed so that exposure to weather conditions or wet and damp locations will not deteriorate the tag or make the tag's message illegible.

(c) Tags must not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.

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(4) Lockout and tagout devices must be the same within the facility in at least color, shape, or size. Also, tagout devices must have the same print and format.

(5) Lockout and tagout devices must be substantial and meet the following requirements:

(a) Lockout devices must be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.

(b) Tagout devices and their means of attachment must be substantial enough to prevent accidental removal. Tagout device attachment means must be single-use, attachable by hand, self-locking, releasable with an unlocking strength of at least 50 pounds, and having the general design and basic characteristics of being at least equivalent to a one-piece, all-environment-tolerant nylon cable tie.

(c) Lockout and tagout devices must indicate the name of employee applying the device(s).

(6) Tagout devices must warn against hazardous conditions if the machine or equipment is energized and must include a message such as: "Do not start," "do not open," "do not close," "do not energize," "do not operate."

[Recodified as § 296-307-32015, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32017 How often must the energy control procedure be inspected? (1) You must conduct an inspection of the energy control procedure at least annually to ensure that the procedure and the requirements of this standard are followed.

(a) An authorized employee, other than the one(s) using the energy control procedure, must perform the inspection.

(b) The inspection must be conducted to correct any deviations or inadequacies identified.

(c) Where lockout is used for energy control, the inspection must include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure.

(d) Where tagout is used for energy control, the inspection must include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure, and the elements of WAC 296-307-32021.

(2) You must certify that the inspections have been performed. The certification must identify the machine or equipment on which the energy control procedure was being used, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-32017, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-32017, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32017, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32019 What general requirements apply to energy control program training and communication? You must provide training to ensure that employees understand the purpose and function of the energy control program, and that employees have the knowledge and skills

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required for the safe application, use, and removal of the energy controls. The training must include the following:

(1) Each authorized employee must receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.

(2) Each affected employee must be instructed in the purpose and use of the energy control procedure.

(3) All other employees who work in an area where energy control procedures must be used, must be instructed about the procedure and the prohibition against attempting to restart or reenergize machines or equipment that are locked out or tagged out.

[Recodified as § 296-307-32019. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32019, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32021 What additional requirements apply to tagout training and communication? When tagout systems are used, employees must also be trained in the following limitations of tags:

(1) Tags are warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.

(2) When a tag is attached to an energy isolating means, it is not to be removed without approval of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.

(3) Tags must be legible and understandable by all authorized, affected, and other employees working in the area.

(4) Tags and their means of attachment must be made of materials that will withstand the environmental conditions encountered in the workplace.

(5) Tags may create a false sense of security, and their meaning needs to be understood as part of the overall energy control program.

(6) Tags must be securely attached to energy isolating devices so that they cannot be accidentally detached during use.

[Recodified as § 296-307-32021. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32021, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32023 What requirements apply to employee retraining? (1) Authorized and affected employees must be retrained whenever there is a change in job assignments, machines, equipment, or processes that present a new hazard, or when there is a change in the energy control procedures.

(2) Additional retraining must also be provided whenever an inspection reveals, or whenever you believe, that the employee's knowledge or use of the energy control procedures is inadequate.

(3) Retraining must reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

[Recodified as § 296-307-32023. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32023, filed 10/31/96, effective 12/1/96.]

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WAC 296-307-32025 What training records must an employer keep? You must keep records that certify that employee training has been completed and is up to date. The records must contain each employee's name and dates of training.

[Recodified as § 296-307-32025. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32025, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32027 Who may perform lockout or tagout? Lockout or tagout must be performed only by authorized employees performing the service or maintenance.

[Recodified as § 296-307-32027. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32027, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32029 Who must be notified of lockout and tagout? Affected employees must be notified of the application and removal of lockout or tagout devices. Notification must be given before controls are applied and after they are removed.

[Recodified as § 296-307-32029. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32029, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32031 What order of events must lockout or tagout procedures follow? The established lockout or tagout procedures must cover the following elements in the following sequence:

Machinery or equipment shutdown before lockout or tagout:

(1) Before an authorized or affected employee turns off a machine or equipment, the authorized employee must have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.

(2) The machine or equipment must be turned off or shut down using the procedures established for the machine or equipment. The shutdown must be done in the prescribed order to avoid increased hazards to employees.

(3) All necessary energy isolating devices must be physically located and operated in such a manner as to isolate the machine or equipment from the energy source.

Application of the lockout or tagout device:

(4) Lockout or tagout devices must be affixed to each energy isolating device by authorized employees.

(5) Lockout devices, where used, must be affixed in a manner that will hold the energy isolating devices in a "safe" or "off" position.

(6) Tagout devices, where used, must be affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited.

(a) Where tagout devices are used with energy isolating devices designed with the capability of being locked, the tag attachment must be fastened at the same point at which the lock would have been attached.

(b) Where a tag cannot be affixed directly to the energy isolating device, the tag must be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

Eliminating the hazards of stored energy:

(7) After applying lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy must be relieved, disconnected, restrained, and otherwise rendered safe.

(8) If there is a possibility of reaccumulation of stored energy to a hazardous level, verification of isolation must be continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.

Before beginning service or maintenance:

(9) Prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee must verify that the machine or equipment has been isolated and deenergized.

[Recodified as § 296-307-32031, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32031, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32033 What order of events must be followed to remove lockout or tagout devices? (1) Before removing lockout or tagout devices, the authorized employee must complete the following procedures:

(a) Inspect the work area to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact.

(b) Check the work area to ensure that all employees have been safely positioned or removed.

(2) After lockout or tagout devices have been removed and before a machine or equipment is started, affected employees must be notified that the lockout or tagout device(s) have been removed.

(3) Each lockout or tagout device must be removed from each energy isolating device by the authorized employee who applied the device.

Exception:

When the authorized employee who applied the lockout or tagout device is not available to remove it, that device may be removed under your direction, if specific procedures and training for such removal have been developed, documented, and incorporated into the energy control program.

You must ensure that the specific procedure provides equivalent safety to the removal of the device by the authorized employee who applied it. The specific procedure must include at least the following elements:

(a) Verification by the employer that the authorized employee who applied the device is not at the facility;

(b) Making all reasonable efforts to inform the authorized employee that the lockout or tagout device has been removed; and

(c) Ensuring that the authorized employee has this knowledge before resuming work at that facility.

[Recodified as § 296-307-32033, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32033, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32035 What requirements apply to testing and positioning machines and equipment? When lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine or equipment, the following sequence of actions must be followed:

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(1) Clear the machine or equipment of tools and materials according to WAC 296-307-32033 (1)(a).

(2) Remove employees from the machine or equipment area according to WAC 296-307-32033 (1)(b).

(3) Remove the lockout or tagout devices as specified in WAC 296-307-32033(3).

(4) Energize and proceed with testing or positioning.

(5) Deenergize all systems and reapply energy control measures in accordance with WAC 296-307-32031 to continue the servicing and/or maintenance.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-32035, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-32035. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32035, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32037 What requirements apply to outside servicing contractors? (1) Whenever outside servicing contractors are to be engaged in activities covered by this standard, you and the outside employer must inform each other of your respective lockout or tagout procedures.

(2) The outside employer must ensure that employees understand and comply with the restrictions and prohibitions of your energy control program.

[Recodified as § 296-307-32037, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32037, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32039 What requirements apply to group lockout or tagout? (1) When servicing and/or maintenance is performed by a crew or other group, they must use a procedure that provides a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.

(2) Group lockout or tagout devices must be used according to the procedures required by WAC 296-307-32013 including, but not limited to, the following:

(a) An authorized employee has primary responsibility for a set number of employees working under the protection of a group lockout or tagout device (such as an operations lock); and

(b) A method for the authorized employee to determine if individual group members are exposed to release of stored energy hazards; and

(c) When more than one crew or group is involved, assignment of overall lockout or tagout control responsibility to an authorized employee designated to coordinate individual group members and ensure continuity of protection; and

(d) Each authorized employee must affix a personal lockout or tagout device to the group lockout device when beginning work, and must remove those devices when the work is complete.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-32039, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-32039. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32039, filed 10/31/96, effective 12/1/96.]

WAC 296-307-32041 What requirements apply to lockout/tagout during shift changes? During shift or personnel changes, you must ensure that employees follow specific procedures to ensure the continuity of lockout or tagout

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protection. The procedures must include orderly transfer of lockout or tagout protection between off-going and oncoming employees, to minimize exposure to hazards from the unexpected energization or start-up of the machine or equipment, or release of stored energy.

[Recodified as § 296-307-32041. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-32041, filed 10/31/96, effective 12/1/96.]

Part R

Safety Color Coding; Accident Prevention Signs and Tags

WAC 296-307-330 Safety color coding; accident prevention signs and tags.

[Recodified as § 296-307-330. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-330, filed 10/31/96, effective 12/1/96.]

WAC 296-307-33001 What definitions apply to this section? "Accident prevention sign" ("sign") means a surface with text or pictographs, meant to warn or instruct employees who may be exposed to hazards. Safety posters and education bulletins are not included in this definition.

"Accident prevention tag" ("tag") means a card that identifies a hazardous condition, generally related to unsafe equipment.

"Major message" means the sign's or tag's text that is more specific than the signal word and that identifies the specific hazardous condition or safety instruction. Examples include: "High Voltage," "Close Clearance," "Do Not Start," or "Do Not Use" or a corresponding pictograph.

"Pictograph" means a pictorial representation that identifies a specific hazardous condition or safety instruction.

"Signal word" means the sign's or tag's text that contains the word, usually "danger" or "caution" that is intended to capture the employee's immediate attention.

[Recodified as § 296-307-33001. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-33001, filed 10/31/96, effective 12/1/96.]

WAC 296-307-33003 What does red identify in safety color coding? Use red to identify:

- (1) Fire protection equipment;
- (2) Safety cans or other portable containers of flammable liquids;
- (3) Danger signs and tags;
- (4) Emergency stop bars on hazardous machines; and
- (5) Stop buttons or electrical switches used to stop machinery in an emergency;

Red lights must be provided at barricades and at temporary obstructions, as specified in ANSI Safety Code for Building Construction, A10.2-1944.

[Recodified as § 296-307-33003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-33003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-33005 What does yellow identify in safety color coding? Use yellow to identify:

- (1) Caution signs and tags; and
- (2) Physical hazards.

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[Recodified as § 296-307-33005. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-33005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-33007 When should signs and tags use "danger" versus "caution"? (1) Danger signs and tags.

(a) Use danger signs and tags when an immediate hazard presents a threat of death or serious injury to employees.

(b) Instruct all employees that danger signs and tags indicate immediate danger and that special precautions are necessary.

(2) Caution signs and tags.

(a) Use caution signs and tags to warn against potential hazards or to caution against unsafe practices.

(b) Instruct all employees that caution signs and tags indicate a possible hazard against which proper precaution should be taken.

[Recodified as § 296-307-33007. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-33007, filed 10/31/96, effective 12/1/96.]

WAC 296-307-33009 What are the design and color specifications for accident prevention signs? (1) All signs must have rounded or blunt corners and be free from sharp edges. The ends or heads of bolts or other fastening devices must be located so that they do not constitute a hazard.

(2) Danger, caution, directional, informational, exit, and safety instruction signs must comply with the specification of safety colors of the ANSI Z53.1-1971.

[Recodified as § 296-307-33009. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-33009, filed 10/31/96, effective 12/1/96.]

[Recodified as § 296-307-33009. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-33009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-33011 What are the proper uses of accident prevention tags? (1) Use tags as a temporary means of warning employees of a hazardous condition, especially defective equipment. Tags are not a complete warning method, but should be used until the hazard can be eliminated.

For example: You may use a "do not start" tag on power equipment for a short time until the switch in the system can be locked out; you may use a "defective equipment" tag on a damaged ladder while arrangements are made for the ladder to be taken out of service and repaired.

(2) Use of accident prevention tags.

(a) Use tags as a warning to prevent accidental injury or illness to employees who are exposed to hazardous or potentially hazardous conditions, equipment or operations that are out of the ordinary, unexpected or not readily apparent.

(b) Use tags until the identified hazard is eliminated or the hazardous operation is completed. Tags are not necessary if signs, guarding, or other protection is used.

(c) Place "do not start" tags in a conspicuous location and, if possible, so that they block the starting mechanism that would cause hazardous conditions if the equipment was energized.

(3) General accident prevention tag specifications.

(a) Tags must contain a signal word and a major message. The signal word must be either "danger" or "caution."

(b) The signal word must be readable at least five feet from the hazard.

(c) The signal word and the major message must be understandable to all employees who may be exposed to the identified hazard.

(d) Inform all employees of the meaning of the tags used throughout the workplace and what special precautions are necessary.

(e) Attach tags as closely as is safely possible to the hazard. Attach the tags so as to prevent loss or unintentional removal.

(f) The tag and attachment method must be constructed of material that is not likely to deteriorate.

(4) You may use warning tags to represent a hazard level between "caution" and "danger," instead of the required "caution" tag, if they have a signal word of "warning" and an appropriate major message.

(5) Use "out of order" tags only to indicate that a piece of equipment, machinery, etc., is out of order and that it might present a hazard if used.

[Recodified as § 296-307-33011, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-33011, filed 10/31/96, effective 12/1/96.]

Part S

Fire Protection and Ignition Sources; Exit Routes

WAC 296-307-340 Portable fire extinguishers.

[Recodified as § 296-307-340, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-340, filed 10/31/96, effective 12/1/96.]

WAC 296-307-34003 What does this section cover?

(1) WAC 296-307-340 applies to the placement, use, maintenance, and testing of portable fire extinguishers provided for employee use. WAC 296-307-34012 does not apply to extinguishers provided for employee use on the outside of workplace buildings or structures. If you do not intend for employees to use extinguishers, and your emergency action plan and fire prevention plan meet the requirements of WAC 296-307-35018, then only the requirements of WAC 296-307-34015 and 296-307-34018 apply.

(2) All standpipe and hose systems, automatic sprinkler systems, fixed extinguishing systems, dry-chemical fixed extinguishing systems, water-spray and foam, and fire detection systems, must be installed according to state and local ordinances, codes, and regulations governing such installations.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-34003, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-34003, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-34006 Who is exempt from the requirements of this section? (1) You are exempt from all requirements of this section, if:

(a) You have implemented a written fire safety policy that requires all employees to evacuate immediately when the fire alarm sounds; and

(b) You have an emergency action plan and a fire prevention plan meeting the requirements of WAC 296-307-35015 and 296-307-35018; and

(1999 Ed.)

(c) Extinguishers are not available for employee use in the workplace.

Note: If you are covered by one of the following sections requiring you to provide a portable fire extinguisher, then you may not apply this exemption:

- WAC 296-307-07013(12)—Transporting employees;
- WAC 296-307-34009(8)—Storage of flammables; or
- WAC 296-307-49503(2)—Welding.

(2) You are exempt from the distribution requirements in WAC 296-307-34012, if:

(a) You have an emergency action plan meeting the requirements of WAC 296-307-35015 that authorizes only certain employees to use the available portable fire extinguishers; and

(b) The plan requires all other employees to evacuate immediately when the fire alarm sounds.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-34006, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-34006, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34006, filed 10/31/96, effective 12/1/96.]

WAC 296-307-34009 What general requirements apply to portable fire extinguishers?

(1) You must provide portable fire extinguishers that are readily accessible to employees without subjecting the employees to possible injury.

(2) You must only use approved portable fire extinguishers.

(3) Portable fire extinguishers using carbon tetrachloride or chlorobromomethane extinguishing agents are prohibited.

(4) Water type fire extinguishers with a soldered or riveted shell that use self-generating soda acid or self-generating foam or gas cartridges are prohibited.

(5) You must ensure that all portable fire extinguishers are fully charged, operable, and kept in their designated places at all times except during use.

(6) You must ensure that all portable fire extinguishers are tested, constructed, and used according to the National Fire Protection Association's pamphlet No. 10A-1970.

Note: The supplier of the extinguisher or local fire official can furnish this information.

(7) You must post "no smoking" signs in areas where fire or explosion hazards exist. You must prohibit smoking within fifty feet of all refueling operations. Take precautions to prevent open flames, sparks, or electric arcs in refueling areas.

(8) You must keep a portable fire extinguisher with a rating of at least 12-B units outside the door of any room used to store flammables or combustibles. This extinguisher must not be more than ten feet from the door.

[Recodified as § 296-307-34009, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-34012 How should portable fire extinguishers be selected and distributed? (1) You must select and distribute portable fire extinguishers based on the classes

of anticipated workplace fires and on the size and degree of hazard that would affect their use.

(2) Distribution of portable fire extinguishers.

(a) For Class A fires: You must distribute portable fire extinguishers so that no employee must travel more than 75 feet (22.9 m) to a fire extinguisher.

Exception: You may use uniformly spaced standpipe systems or hose stations connected to a sprinkler system for emergency use by employees instead of Class A portable fire extinguishers, if:

- The system meets all regulatory requirements governing total coverage of the area to be protected; and
- Employees are trained at least annually in their use.

(b) For Class B fires: You must distribute portable fire extinguishers so that no employee must travel more than 50 feet (15.2 m) to a fire extinguisher.

(c) For Class C fires: You must distribute portable fire extinguishers on the basis of the appropriate pattern for the existing Class A or Class B hazards.

(d) For Class D fires: You must distribute portable fire extinguishers or other containers of Class D extinguishing agent so no employee must travel more than 75 feet (22.9 m) from the combustible metal working area to any extinguishing agent. Portable fire extinguishers for Class D hazards are required in those combustible metal working areas where combustible metal powders, flakes, shavings, or similarly sized products are generated at least once every two weeks.

[Recodified as § 296-307-34012. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34012, filed 10/31/96, effective 12/1/96.]

WAC 296-307-34015 What are the requirements for inspection, maintenance and testing of portable fire extinguishers? (1) You are responsible for the inspection, maintenance, and testing of all portable fire extinguishers in the workplace.

(2) You must visually inspect portable extinguishers or hose at least once a month.

(3) You must ensure that portable fire extinguishers receive an annual maintenance check. You must keep records of the maintenance dates for one year after the previous entry or the life of the shell, whichever comes first. You must provide us with a copy of the record if we ask for it.

(4) You must ensure that stored-pressure dry chemical extinguishers that require a twelve-year hydrostatic test are emptied and undergo applicable maintenance procedures every six years.

Exception: Dry chemical extinguishers with nonrefillable disposable containers are exempt from this requirement.

The six years begins when recharging or hydrostatic testing is performed.

(5) You must ensure that alternate equivalent protection is provided when portable fire extinguishers are removed from service for maintenance and recharging.

[Recodified as § 296-307-34015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-34018 What requirements apply to hydrostatic testing? (1) You must ensure that a trained person performs hydrostatic testing with suitable testing equipment and facilities.

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(2) You must ensure that portable extinguishers are hydrostatically tested at the intervals listed in the table below.

Type of Extinguishers	Test interval (years)
Soda acid (stainless steel shell)	5
Cartridge operated water and/or antifreeze	5
Stored pressure water and/or antifreeze	5
Wetting agent	5
Foam (stainless steel shell)	5
Aqueous film forming form (AFFF)	5
Loaded stream	5
Dry chemical with stainless steel	5
Carbon dioxide	5
Dry chemical, stored pressure, with mild steel, brazed brass or aluminum shells	12
Dry chemical, cartridge or cylinder operated, with mild steel shells	12
Halon 1211	12
Halon 1301	12
Dry powder, cartridge or cylinder operated, with mild steel shell	12

Exception: Extinguishers must not be hydrostatically tested if the following conditions exist:

- (a) When the unit has been repaired by soldering, welding, brazing, or use of patching compounds;
- (b) When the cylinder or shell threads are damaged;
- (c) When there is corrosion that has caused pitting, including corrosion under removable name plate assemblies;
- (d) When the extinguisher has been burned in a fire; or
- (e) When a calcium chloride extinguishing agent has been used in a stainless steel shell.

(3) In addition to an external visual examination, you must ensure that the cylinders and shells are examined internally before the hydrostatic testing.

(4) You must ensure that portable fire extinguishers are hydrostatically tested whenever they show new evidence of corrosion or mechanical injury.

(5) You must ensure that hydrostatic tests are performed on extinguisher hose assemblies that are equipped with a shut-off nozzle at the discharge end of the hose. The test interval must be the same as specified for the extinguisher on which the hose is installed.

(6) Carbon dioxide hose assemblies with a shut-off nozzle must be hydrostatically tested at 1,250 psi (8,620 kPa).

(7) Dry chemical and dry powder hose assemblies with a shut-off nozzle must be hydrostatically tested at 300 psi (2,070 kPa).

(8) Hose assemblies passing a hydrostatic test do not require any type of recording or stamping.

(9) You must ensure that hose assemblies for carbon dioxide extinguishers that require a hydrostatic test are tested within a protective cage device.

(10) You must ensure that carbon dioxide extinguishers and nitrogen or carbon dioxide cylinders used with wheeled extinguishers are tested every five years at 5/3 of the service pressure as stamped into the cylinder. Nitrogen cylinders that comply with 29 CFR 173.34(e)(15) may be hydrostatically tested every ten years.

(11) You must ensure that all stored pressure and Halon 1211 types of extinguishers are hydrostatically tested at the factory test pressure not to exceed two times the service pressure.

(12) You must ensure that self-generating type soda acid and foam extinguishers are tested at 350 psi (2,410 kPa).

(13) Air or gas pressure used for hydrostatic testing is prohibited.

(14) You must remove from the workplace all extinguisher shells, cylinders, or cartridges that fail a hydrostatic pressure test, or that are not fit for testing.

(15)(a) Water-jacket equipment must be used for testing compressed gas type cylinders. The equipment must have an expansion indicator that operates with an accuracy within one percent of the total expansion or 0.1 cc (.1 mL) of liquid.

(b) The following equipment must be used to test non-compressed gas type cylinders:

(i) A hydrostatic test pump, hand or power operated, capable of producing not less than one hundred fifty percent of the test pressure, which must include appropriate check valves and fittings;

(ii) A flexible connection for attachment to fittings to test through the extinguisher nozzle, test bonnet, or hose outlet, as is applicable; and

(iii) A protective cage or barrier for personal protection of the tester, designed to provide visual observation of the extinguisher under test.

(16) You must maintain records of the hydrostatic testing. Your records must include:

- The date of test;
- The test pressure used;
- The serial number, or other identifier of the fire extinguisher that was tested; and
- The person or agency performing the test.

You must keep the records until the next testing, or until the extinguisher is taken out of service, whichever comes first. You must provide us with copies of the records if we ask for them.

[Recodified as § 296-307-34018. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34018, filed 10/31/96, effective 12/1/96.]

WAC 296-307-34021 What are the training requirements for portable fire extinguishers? (1) If you provide portable fire extinguishers for employee use, then you must also provide training to familiarize employees with the general principles of fire extinguisher use and the hazards involved in fighting fires when they first appear.

You must provide the training when the employee is first hired and at least annually thereafter.

(2) For employees who have been designated to use fire fighting equipment as part of an emergency action plan, you must provide training in the use of the appropriate equipment.

You must provide the training upon initial assignment to the designated group of employees and at least annually thereafter.

[Recodified as § 296-307-34021. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34021, filed 10/31/96, effective 12/1/96.]

WAC 296-307-345 Employee alarm systems.

(1999 Ed.)

[Recodified as § 296-307-345. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-345, filed 10/31/96, effective 12/1/96.]

WAC 296-307-34503 What does this section cover?

(1) WAC 296-307-345 applies to all emergency employee alarms required by a specific WAC chapter. This section does not apply to discharge or supervisory alarms required on various fixed extinguishing systems or to supervisory alarms on fire suppression, alarm or detection systems unless they are intended to be employee alarm systems.

(2) The maintenance, testing, and inspection requirements of this section apply to all local fire alarm signaling systems used for alerting employees regardless of the other functions of the system.

(3) All predischarge employee alarms required by this chapter must meet the requirements of WAC 296-307-34506 and 296-307-34512.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-34503, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-34503. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34503, filed 10/31/96, effective 12/1/96.]

WAC 296-307-34506 What general requirements apply to employee alarm systems? (1) Your employee alarm system must provide warning for necessary emergency action called for in the emergency action plan, or safe escape of employees from the workplace.

(2) You must ensure that all employees can see or hear your employee alarm above normal noise or light levels in the workplace. You may use tactile devices to alert employees who can not see or hear the alarm.

(3) You must ensure that your employee alarm is recognizable as an evacuation signal or signal to perform actions designated under the emergency action plan.

(4) You must explain to each employee how to report emergencies. For example: They may use manual pull box alarms, public address systems, radio or telephones. You must post emergency telephone numbers near telephones, or employee notice boards when telephones serve as a means of reporting emergencies. When your communication system also serves as the employee alarm system, you must ensure that all emergency messages have priority over all non-emergency messages.

(5) You must establish procedures for sounding emergency alarms in the workplace. If you have ten or fewer employees in a workplace, direct voice communication is an acceptable procedure for sounding the alarm if all employees can hear it. In this case, you do not need a back-up system.

[Recodified as § 296-307-34506. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34506, filed 10/31/96, effective 12/1/96.]

WAC 296-307-34509 What are the installation and restoration requirements for employee alarm systems?

(1) You must ensure that all systems installed to comply with this standard are approved. Steam whistles, air horns, strobe lights or similar lighting devices, or tactile devices meeting the requirements of this section must also be approved.

(2) After each test or alarm, you must ensure that all employee alarm systems are restored to normal operating

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condition as soon as possible. You must ensure that you have spare alarm components available in sufficient quantities and locations for prompt restoration of the system.

[Recodified as § 296-307-34509, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34509, filed 10/31/96, effective 12/1/96.]

WAC 296-307-34512 How must employee alarm systems be maintained and tested? (1) You must ensure that all employee alarm systems are maintained in operating condition except when undergoing repairs or maintenance.

(2) You must ensure that a test of the reliability and adequacy of nonsupervised employee alarm systems is made every two months. You must use a different actuation device in each test of a multiactuation device system so that no individual device is used for two consecutive tests.

(3) You must maintain or replace power supplies as often as necessary to ensure fully operational condition. You must provide back-up alarms, such as employee runners or telephones, when systems are out of service.

(4) You must ensure that supervised employee alarm circuitry is supervised and that it will provide positive notification to assigned personnel whenever a deficiency exists in the system. You must ensure that all supervised employee alarm systems are tested at least annually for reliability and adequacy.

(5) You must ensure that employee alarms are serviced, maintained, and tested by someone trained in the operation and functions necessary for reliable and safe operation of the system.

[Recodified as § 296-307-34512, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34512, filed 10/31/96, effective 12/1/96.]

WAC 296-307-34515 Where must manually operated devices be located? You must ensure that manually operated actuation devices used with employee alarms are easy to find and accessible.

[Recodified as § 296-307-34515, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-34515, filed 10/31/96, effective 12/1/96.]

WAC 296-307-350 Exit routes.

[Recodified as § 296-307-350, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-350, filed 10/31/96, effective 12/1/96.]

WAC 296-307-35003 What does this section cover? WAC 296-307-350 requires you to provide exit routes for employees to leave the workplace safely during emergencies. This section does not apply to mobile workplaces, such as vehicles or vessels.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-35003, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-35003, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-35003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-35006 What definitions apply to this section? "Exit" means the portion of an exit route that is generally separated from other areas to provide a protected way of travel out of the workplace.

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"Exit route" means a continuous and unobstructed path of exit travel from any point within a workplace to safety outside. An exit route generally consists of three parts: Access to an exit; the area which provides a way of travel out of the workplace; and the way from the exit to the outside. An exit route includes all vertical and horizontal areas.

[Recodified as § 296-307-35006, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-35006, filed 10/31/96, effective 12/1/96.]

WAC 296-307-35009 What are the design requirements for exit routes? You must ensure that each workplace meets each of the following requirements:

(1) Each exit is a permanent part of the workplace.

(2) Two exit routes, remote from one another, are available to provide alternate means for employees to safely leave the workplace during an emergency.

(a) A single exit route is permitted where the number of employees, the size of the building, its occupancy, or the arrangement of the workplace indicate that a single exit will allow all employees to exit safely during an emergency. Other means of escape, such as fire exits or accessible windows, should be available where fewer than two exit routes are provided.

(b) More than two exit routes are available to allow employees to safely leave the workplace during an emergency where the number of employees, the size of the building, its occupancy, or the arrangement of the workplace reasonably suggest that reliance on two exit routes could endanger employees.

(3) An exit has only those openings necessary to permit access to, or exit from, occupied areas of the workplace. An opening into an exit is protected by a self-closing fire door that remains closed. Each fire door, its frame, and hardware are listed or approved by a nationally recognized testing laboratory.

(4) Construction materials used to separate an exit have a 1-hour fire resistance rating if the exit connects three or fewer stories. Construction materials used to separate an exit have a 2-hour fire resistance rating if the exit connects 4 or more stories.

(5) Free and unobstructed access to each exit route is provided to ensure safe exit during an emergency.

(a) The exit route is free of material or equipment.

(b) Employees are not required to travel through a room that can be locked, such as a bathroom, or toward a dead end to reach an exit.

(c) Stairs or a ramp are used if the exit route is not substantially level.

(6) An exit leads directly outside or to a street, walkway, refuge area, or to an open space with access to the outside.

(a) The street, walkway, refuge area, or open space to which an exit leads is large enough to accommodate all building occupants likely to use that exit.

(b) A refuge area is:

(i) A space along an exit route protected from the effects of fire either by separation from other spaces within the building or by its location; or

(ii) A floor with at least two spaces separated by smoke-resistant partitions, in a building where each floor is protected by an automatic sprinkler system. An automatic sprinkler

system complies with NFPA No. 13, Automatic Sprinkler Systems.

(c) Exit stairs that continue beyond the floor of exit discharge are interrupted by doors, partitions, or other effective means.

(7) Where a doorway or corner of a building is located near a railroad or trolley track so that an employee is liable to walk upon the track in front of an approaching engine or cars, a standard safeguard must be installed with a warning sign.

(8) An exit door can be readily opened from the inside without keys, tools, or special knowledge. A device, such as a panic bar, that locks only from the outside is permitted. An exit door is free of any device or alarm that, if it fails, can restrict emergency use of an exit.

Note: An exit door may be locked or blocked from the inside in a mental, penal, or correctional institution, if supervisory personnel are continually on duty and a plan exists to remove occupants during an emergency.

(9) The opening device on all doors of walk-in refrigerated or freezer rooms must be the type, when locked from the outside with a lock, can be opened from inside.

(10) A side-hinged exit door is used to connect any room to an exit route. A door that connects any room to an exit route swings out if the room may be occupied by more than 50 persons or highly flammable or explosive materials may be used inside.

(11) Each exit route supports the maximum-permitted occupant load for each floor served by the exit route. The capacity of an exit does not decrease with the direction of exit travel.

(12) Minimum height and width requirements:

(a) The ceiling for an exit route is at least 7 feet 6 inches high and the exit route is at least 6 feet 8 inches high at all points.

(b) The width of an exit route is at least 28 inches wide at all points between handrails. An exit route is wider than 28 inches if necessary to accommodate the expected occupant load.

(c) Objects that project into the exit route do not reduce the minimum height and width of an exit route.

(13) An outdoor exit route is permitted if it meets the requirements for an indoor exit route and the following additional requirements.

(a) The exit has guardrails to protect exposed sides.

(b) The exit route is covered if accumulation of snow or ice is likely and is not removed regularly.

(c) The exit route is reasonably straight with smooth, solid, substantially level floors.

(d) The exit route has no dead ends longer than 20 feet.

[Recodified as § 296-307-35009, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-35009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-35012 What are the operation and maintenance requirements for exit routes? You must ensure that each workplace meets the following requirements:

(1) The workplace exit route is maintained to minimize danger to employees during an emergency.

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(a) The workplace exit route is free of explosive or highly flammable furnishings or decorations.

(b) Accumulations of flammable or combustible waste materials are controlled.

(c) An exit route does not require employees to travel toward materials that burn very quickly, emit poisonous fumes, or are explosive, unless those materials are effectively shielded from the exit route.

(2) Each exit route is adequately lit.

(3) Each exit is clearly visible and is marked by a distinctive sign reading "exit."

(a) An exit door is free of signs or decorations that obscure its visibility.

(b) Signs are posted along the exit route indicating the direction of travel to the nearest exit.

(c) The line-of-sight to an exit sign is uninterrupted.

(d) Any doorway or passage that might be mistaken for an exit is marked "not an exit" or with an indication of its actual use.

(e) An exit sign is illuminated to a surface value of at least 5 foot candles by a reliable light source and shows a designated color. Self-luminous or electroluminescent signs have a minimum luminance surface value of .06 footlamberts.

(4) Fire retardant paints or other coatings used in the workplace are maintained.

(5) Each safeguard to protect employees during an emergency is maintained in proper working order.

(6) Employees do not occupy a workplace under construction until an exit route that meets these requirements is available for the portion of the workplace to be occupied.

(a) Employees do not occupy a workplace during repair or alteration unless either all exits and existing fire protection are maintained or alternate fire protection is provided that ensures an equivalent level of safety.

(b) Flammable or explosive materials used during construction or repair do not expose employees to hazards not otherwise present in the workplace or impede emergency escape from the workplace.

(7) An operable employee alarm system with a distinctive signal to warn employees of fire or other emergencies is installed and maintained. No employee alarm system is required if employees can see or smell a fire or other hazard so that it would provide adequate warning to them. The employee alarm system complies with the requirements of WAC 296-307-345.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-35012, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-35012, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-35012, filed 10/31/96, effective 12/1/96.]

WAC 296-307-35015 What are the requirements for an emergency action plan? (1) You must develop an emergency action plan for each part of the workplace as required by WAC 296-307-030 (3)(d).

(a) The plan must be in writing, kept in the workplace, and made available to employees on request.

(b) An employer of 10 or fewer employees may communicate the plan orally to employees rather than develop a written plan.

(2) An emergency action plan must include:

[Title 296 WAC—p. 2573]

- (a) Procedures for emergency evacuation, including exit route assignments;
- (b) Procedures to account for all employees after evacuation;
- (c) Procedures for reporting a fire or other emergency;
- (d) Procedures to follow for emergency operation or shut down of critical equipment before evacuation;
- (e) Procedures to follow for rescue and medical duties;
- (f) Procedures for operating and maintaining an emergency alarm system; and
- (g) Names or job titles of employees to be contacted to get more information about what to do in an emergency.

(3) You must designate employees to assist in the safe emergency evacuation of other employees. You must ensure that the designated employees receive training in emergency evacuation procedures.

(4) You must review the emergency action plan with each employee covered by the plan:

- (a) When the plan is developed or the employee is assigned initially to the job;
- (b) When the employee's responsibilities under the plan change; and
- (c) When the plan is changed.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-35015, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-35015, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-35015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-35018 What are the requirements for a fire prevention plan? (1) You must develop a fire prevention plan for each part of the workplace if required by WAC 296-307-34006(1).

(a) The plan must be in writing, kept in the workplace, and made available to employees on request.

(b) An employer of 10 or fewer employees may communicate the plan orally to employees rather than develop a written plan.

(2) A fire prevention plan must include:

(a) A list of all major fire hazards, including proper handling and storage procedures for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each major hazard;

(b) Procedures to control accumulations of flammable and combustible waste materials;

(c) Procedures for regular maintenance of safeguards installed on heat producing equipment to prevent accidental ignition of combustible materials;

(d) Names or job titles of employees responsible for maintaining equipment to prevent or control sources of ignition or fires;

(e) Names or job titles of employees responsible for control of fuel source hazards.

(3) You must:

(a) Inform employees of the fire hazards to which they are exposed; and

(b) Review with each employee those parts of the fire prevention plan necessary for self-protection upon initial assignment to a job.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-35018, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-35018, 97-09-013, filed

4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-35018, filed 10/31/96, effective 12/1/96.]

Part T Electrical

WAC 296-307-360 Electrical.

[Recodified as § 296-307-360, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-360, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36005 What does this part cover? (1) Chapter 296-307 WAC Part T covers methods to protect against electrical hazards in agricultural workplaces.

(2) Chapter 296-307 WAC Part T does not cover:

- Installations in watercraft, or automotive vehicles; or
- Electric welding. (See chapter 296-307 WAC Part V.)

(3) Unless otherwise provided in this chapter all electrical work, installation, and wire capacities must be according to the National Electrical Code, NFPA 70-1973; ANSI C1-1971, and all other applicable standards administered by the department of labor and industries.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-36005, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-36005, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-36005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36010 What definitions apply to this part? The following definitions apply to this part:

"Acceptable" means an installation or equipment that is acceptable to the department and meets the requirements of this section. An installation or equipment is acceptable if:

(1) It is accepted, certified, listed, labeled, or otherwise determined to be safe by a nationally recognized testing laboratory; or

(2) For installations or equipment that no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, it is inspected or tested by another federal agency, or by state, municipal, or other local authority responsible for enforcing occupational safety provisions of the National Electrical Code, and complies with the provisions of the National Electrical Code, and complies with the provisions of the National Electrical Code as applied in this section; or

(3) For custom-made equipment or related installations that are designed, fabricated for, and intended for use by a particular customer, it is determined to be safe for its intended use by its manufacturer on the basis of test data that you keep and make available for our inspection.

"Accepted" means an installation that has been inspected and certified by a nationally recognized testing laboratory to meet specified plans or procedures of applicable codes.

"Bonding jumper" means a reliable conductor that provides the correct electrical conductivity between metal parts that are required to be electrically connected.

"Branch circuits" means the part of a wiring system extending beyond the final overcurrent device protecting the circuit. A device not approved for branch circuit protection, such as thermal cutout or motor overload protective device, is

not considered as the overcurrent device protecting the circuit.

"Certified" means equipment that:

- Has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards, or to be safe for use in a specified manner; or
- Is a kind whose production is periodically inspected by a nationally recognized testing laboratory; and
- Bears a label, tag, or other record of certification.

"Exposed" means a live part that can be accidentally touched or approached nearer than a safe distance. This term applies to parts that are not suitably guarded, isolated, or insulated.

"Fixed equipment" means equipment fastened or connected by permanent wiring methods.

"Ground" means a conducting connection, whether intentional or accidental, between an electrical circuit or equipment and earth, or to some conducting body that serves in place of the earth.

"Grounded" means connected to earth or to some conducting body that serves in place of the earth.

"Isolated" means equipment that is not readily accessible except through special means of access.

"Labeled" means equipment that has an attached label, symbol, or other identifying mark of a nationally recognized testing laboratory that:

- Makes periodic inspections of the production of such equipment; and
- Whose labeling indicates compliance with nationally recognized standards or tests to determine safe use in a specified manner.

"Qualified person" means a person who is familiar with the construction and operation of the equipment and the hazards involved.

Note 1: Whether an employee is considered a "qualified person" depends on various circumstances in the workplace. It is possible and likely for an individual to be considered "qualified" with regard to certain equipment in the workplace, but "unqualified" as to other equipment.

Note 2: An employee undergoing on-the-job training and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person is considered a qualified person for the performance of those duties.

"Shock hazard" exists at an accessible part in a circuit between the part and ground, or other accessible parts if the potential is more than 42.4 volts peak and the current through a 1,500 ohm load is more than 5 milliamperes.

"Weatherproof" means constructed or protected so that exposure to the weather does not interfere with successful operation. Rainproof, raintight, or watertight equipment may be considered weatherproof where weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

[Recodified as § 296-307-36010. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36010, filed 10/31/96, effective 12/1/96.]

WAC 296-307-362 General electrical requirements.

[Recodified as § 296-307-362. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-362, filed 10/31/96, effective 12/1/96.]

(1999 Ed.)

WAC 296-307-36203 What electrical equipment must be approved? The conductors and equipment required or permitted by this section must be approved.

[Recodified as § 296-307-36203. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36203, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36206 How must electrical equipment safety be determined? (1) Electrical equipment must be free from hazards to employees. Safety of equipment must be determined using the following considerations:

(a) Suitability for installation and use according to the requirements of this part. Suitability of equipment for a specific purpose may be shown by listing or labeling for that purpose.

(b) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection provided.

(c) Electrical insulation.

(d) Heating effects under conditions of use.

(e) Arcing effects.

(f) Classification by type, size, voltage, current capacity, specific use.

(g) Other factors that contribute to the practical safeguarding of employees using or likely to come in contact with the equipment.

(2) Listed or labeled equipment must be used or installed according to any instructions included in the listing or labeling.

[Recodified as § 296-307-36206. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36206, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36209 What requirements apply to guarding live parts? (1) Unless otherwise indicated, live parts of electric equipment operating at 50 volts or more must be guarded against accidental contact by an approved cabinet or other form of approved enclosure, or by any of the following:

(a) Location in a room, vault, or similar enclosure that is accessible only to qualified persons.

(b) Suitable permanent substantial partitions or screens arranged so that only qualified persons have access to the area within reach of the live parts. Any openings in such partitions or screens must be small enough and located so that employees are not likely to come into accidental contact with live parts or to bring conducting objects into contact with them.

(c) Location on a suitable balcony, gallery, or platform elevated and accessible only to qualified persons.

(d) Elevation of eight feet or more above the floor or other working surface.

(2) In locations where electric equipment would be exposed to physical damage, enclosures or guards must be arranged and be strong enough to prevent damage.

(3) Entrances to rooms and other guarded locations containing exposed live parts must be marked with conspicuous warning signs forbidding unqualified persons to enter.

(4) Electrical repairs must be made only by qualified persons that you authorize.

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(5) Fuse handling equipment, insulated for the circuit voltage, must be used to remove or install fuses when the fuse terminals are energized.

(6) Employees must be prohibited from working closely enough to an electric power circuit to contact it unless the employee is protected against electric shock.

Note: The circuit must be protected by deenergizing the circuit and grounding it, by guarding it, by effective insulation, or other means.

(7) In work areas where the exact location of underground electric power lines is unknown, employees using jack-hammers, bars or other hand tools that may contact a line must have insulated protective gloves.

[Recodified as § 296-307-36209. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36209, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36212 What workspace must be provided? (1) When parts are exposed, the minimum clearance for the workspace must be at least six feet six inches high, or at least a radius of three feet wide.

(2) There must be enough clearance to permit at least a 90° opening of all doors or hinged panels.

[Recodified as § 296-307-36212. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36212, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36215 What general requirements apply to splices? Conductors must be spliced or joined with splicing devices suitable for the use or by brazing, welding, or soldering with a fusible metal or alloy. Soldered splices must first be spliced or joined so they are mechanically and electrically secure without solder and then soldered. (Rosin-core solder should be used instead of acid core solder when joining electrical conductors.) All splices and joints and the free ends of conductors must be covered with an insulation equivalent to that of the conductors or with an insulating device suitable for the purpose.

[Recodified as § 296-307-36215. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36215, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36218 What protection must be provided against combustible materials? Parts of electric equipment that in ordinary operation produce arcs, sparks, flames, or molten metal must be enclosed or separated and isolated from all combustible material.

[Recodified as § 296-307-36218. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36218, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36221 How must electrical equipment be marked? All electrical equipment in use must have the manufacturer's name, trademark, or other descriptive marking of the organization responsible for the product on the equipment. Other markings must be provided giving voltage, current, wattage, or other ratings as necessary. The marking must be durable enough to withstand the environment.

[Recodified as § 296-307-36221. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36221, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36224 How must disconnecting means be marked? Each disconnecting means required by this part for motors and appliances must be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, must be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings must be durable enough to withstand the environment involved.

[Recodified as § 296-307-36224. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36224, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36227 What access and working space must be provided for electrical equipment of 600 volts, nominal, or less? Sufficient access and working space must be provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment.

(1) Unless otherwise indicated, the dimension of the working space in the direction of access to live parts operating at 600 volts or less and likely to require examination, adjustment, servicing, or maintenance while alive must be at least that indicated in the table below. Also, workspace must be at least 30 inches wide in front of the electric equipment. Distances must be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. Concrete, brick, or tile walls are considered grounded. Working space is not required behind assemblies such as dead-front switchboards or motor control centers where there are no renewable or adjustable parts such as fuses or switches on the back and where all connections are accessible from other directions.

Working Clearances

Nominal voltage to ground	Minimum clear distance for condition (ft)		
	(a)	(b)	(c)
0-150	13	13	3
151-600	13	3-1/2	4

Conditions:

- (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides guarded by suitable wood or other insulating material. Insulated wire or insulated busbars operating at 300 volts or less are not considered live parts.
- (b) Exposed live parts on one side and grounded parts on the other side.
- (c) Exposed live parts on both sides of the workspace (not guarded as in (a)) with the operator between.

(2) Working space required by this part must not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, must be suitably guarded.

(3) At least one entrance of sufficient area must be provided to give access to the working space about electric equipment.

(4) Where there are live parts normally exposed on the front of switchboards or motor control centers, the working space in front of such equipment must be at least 3 feet.

(5) All working spaces around service equipment, switchboards, panelboards, and motor control centers installed indoors must be adequately lit.

(6) The minimum headroom of working spaces about service equipment, switchboards, panelboards, or motor control centers must be 6 feet 3 inches.

"Motor control center" means an assembly of one or more enclosed sections having a common power bus and principally containing motor control units.

[Recodified as § 296-307-36227. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36227, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36230 What access and working space must be provided for electrical equipment over 600 volts, nominal? (1) Conductors and equipment used on circuits exceeding 600 volts, nominal, must meet all requirements of WAC 296-307-36221 and the additional requirements of this section. This section does not apply to equipment on the supply side of the service conductors.

(2) Electrical installations in a vault, room, closet or area surrounded by a wall, screen, or fence, with access controlled by lock and key or other approved means, are considered accessible to qualified persons only. A wall, screen, or fence less than 8 feet high is not considered to prevent access unless it has other features that provide a degree of isolation equivalent to an 8 foot fence. The entrances to all buildings, rooms, or enclosures containing exposed live parts or exposed conductors operating at over 600 volts, nominal, must be kept locked or under the observation of a qualified person at all times.

(a) Electrical installations with exposed live parts must be accessible to qualified persons only.

(b) Electrical installations that are open to unqualified persons must be made with metal-enclosed equipment or enclosed in a vault or in an area, with access controlled by a lock. If metal-enclosed equipment is installed so that the bottom of the enclosure is less than 8 feet above the floor, the door or cover must be kept locked. Metal-enclosed switchgear, unit substations, transformers, pull boxes, connection boxes, and other similar associated equipment must be marked with appropriate caution signs. If equipment is exposed to physical damage from vehicular traffic, guards must be provided to prevent damage. Ventilating or similar openings in metal-enclosed equipment must be designed so that foreign objects inserted through these openings will be deflected from energized parts.

(3) You must provide and maintain enough space around electric equipment to permit ready and safe operation and maintenance of equipment. Where energized parts are exposed, the minimum clear workspace must be at least 6 feet 6 inches high (measured vertically from the floor or platform), or less than 3 feet wide (measured parallel to the equipment). The depth must meet the requirements of Table T. The workspace must be adequate to permit at least a 90-degree opening of doors or hinged panels.

(1999 Ed.)

(a) The minimum clear working space in front of electric equipment such as switchboards, control panels, switches, circuit breakers, motor controllers, relays, and similar equipment must be at least that specified in Table T unless otherwise indicated. Distances must be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. However, working space is not required in back of equipment such as deadfront switchboards or control assemblies where there are no renewable or adjustable parts (such as fuses or switches) on the back and where all connections are accessible from another direction. Where rear access is required to work on deenergized parts on the back of enclosed equipment, a minimum working space of 30 inches horizontally shall be provided.

Table T
Minimum Depth of Clear Working Space
in Front of Electric Equipment

Nominal voltage to ground	Conditions (ft)		
	(a)	(b)	(c)
601 to 2,500	3	4	5
2,501 to 9,000	4	5	6
9,001 to 25,000	5	6	9
25,001 to 75kV1	6	8	10
Above 75kV1	8	10	12

Note: Minimum depth of clear working space in front of electric equipment with a nominal voltage to ground above 25,000 volts may be the same as for 25,000 volts under conditions (a), (b) and (c) for installations built prior to April 16, 1981.

Conditions:

(a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides guarded by suitable wood or other insulating materials. Insulated wire or insulated busbars operating at 300 volts or less are not considered live parts.

(b) Exposed live parts on one side and grounded parts on the other side. Concrete, brick, or tile walls will be considered grounded surfaces.

(c) Exposed live parts on both sides of the workspace (not guarded as in (a)) with the operator between.

(b) All working spaces around electric equipment must be adequately lit. The lighting outlets shall be arranged so that anyone changing lamps or making repairs on the lighting system will not be endangered by live parts or other equipment. The points of control must be located so that no one is likely to come in contact with any live part or moving part of the equipment while turning on the lights.

(c) Unguarded live parts above working space must be elevated to at least the height specified below:

Elevation of Unguarded
Energized Parts Above Working Space

Nominal voltage between phases	Minimum elevation
601 to 7,500	8 feet 6 inches
7,501 to 35,000	9 feet

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Nominal voltage between phases	Minimum elevation
Over 35kV	9 feet + 0.37 inches per kV above 35kV

Note: Minimum elevation may be 8 feet for installations built prior to April 16, 1981, if the nominal voltage between phases is in the range of 601-6600 volts.

(4) Entrance and access to workspace must meet the following requirements:

(a) At least one entrance that is at least 24 inches wide and 6 feet 6 inches high must be provided to give access to the working space around electric equipment. On switchboard and control panels over 48 inches wide, there must be one entrance at each end of the board where practical. Where bare energized parts at any voltage or insulated energized parts above 600 volts are located adjacent to the entrance, they must be suitably guarded.

(b) Permanent ladders or stairways must be provided to give safe access to the working space around electric equipment installed on platforms, balconies, mezzanine floors, or in attic or roof rooms or spaces.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-36230, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-36230, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-36230, filed 10/31/96, effective 12/1/96.]

WAC 296-307-364 Electrical installation and maintenance.

[Recodified as § 296-307-364, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-364, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36403 How must flexible cords and cables be installed and maintained? (1) Extension cords used with portable electric tools and appliances must be three wire and must be fitted with an approved grounding attachment plug and receptacle providing ground continuity.

Exception: This does not apply to cords used with portable tools and equipment provided by an approved system of double insulation or its equivalent.

(2) Worn or frayed electric cables are prohibited.

[Recodified as § 296-307-36403, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-36403, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36406 How must attachment plugs and receptacles be installed and maintained? (1) Attachment plugs used in work areas must be constructed so that they will endure rough use and have a suitable cord grip to prevent strain on the terminal screws.

(2) Attachment plugs must be approved grounding plugs.

(3) Receptacles for attachment plugs must have approved concealed contacts with a contact for extending ground continuity. Receptacles must be designed and constructed to ensure that the plug can be pulled out without leaving any live parts exposed to accidental contact.

(4) Polarized attachment plugs, receptacles, and cord connectors must be wired to maintain continuity.

[Title 296 WAC—p. 2578]

(5) Polarized attachment plugs, receptacles, and cord connectors for plugs and polarized plugs must have the terminal intended for connection to the grounded (white) conductor identified by a metal coating that is mostly white. If the terminal is not visible, its entrance hole must be marked with the word "white," or the color white.

(6) The terminal for the connection of the equipment grounding conductor must be:

(a) A green colored, not easily removed terminal screw with hexagonal head; or

(b) A green colored, hexagonal, not easily removed terminal nut; or

(c) A green colored pressure wire connector.

If the terminal for the grounding conductor is not visible, the conductor entrance hole must be marked with the word "green" or the color green.

Note: Two-wire attachment plugs, unless of the polarity type, need not have their terminals marked for identification.

(7) Where different voltages, or types of current (A.C. or D.C.) are to be supplied by portable cords, receptacles must be designed so that attachment plugs used on the circuits are not interchangeable.

(8) Attachment plugs or other connectors supplying equipment at more than 300 volts must be skirted or otherwise designed so that arcs are confined.

[Recodified as § 296-307-36406, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-36406, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36409 What must employees do when equipment causes electrical shock? Employees must report all shocks received from electrical equipment, no matter how slight, immediately to you. The equipment causing the shock must be checked and any necessary corrective action taken immediately.

[Recodified as § 296-307-36409, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-36409, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36412 What grounding and bonding requirements apply to equipment installation and maintenance? (1) The path to ground must have enough carrying capacity to conduct safely the currents likely to be imposed on it; and have low enough impedance to limit the potential above ground and to result in the operation of the overcurrent devices in the circuit.

(2) Driven rod electrodes must, where practical, have a resistance to ground of a maximum of 25 ohms. Where the resistance is over 25 ohms, two electrodes connected in parallel shall be used.

(3) Grounding circuits must be checked to ensure that the circuit between the ground and the grounded power conductor has a resistance that is low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

(4) Conductors used for bonding and grounding equipment must be large enough to carry the anticipated current.

[Recodified as § 296-307-36412, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-36412, filed 10/31/96, effective 12/1/96.]

(1999 Ed.)

WAC 296-307-36415 What requirements apply to disconnecting means? (1) Disconnecting means must be located or shielded so that employees will not be injured. Using open knife switches is prohibited.

(2) Boxes for disconnecting means must be securely and rigidly fastened to the surface upon which they are mounted, and fitted with covers.

[Recodified as § 296-307-36415, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36415, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36418 What requirements apply to identification and load rating of electrical equipment? (1) Name plates, rating data, and marks of identification on electrical equipment and electrically operated machines must not be removed, defaced or obliterated.

(2) In existing installations, no changes in circuit protection must be made to increase the load beyond the load rating of the circuit wiring, as specified in the National Electrical Code, NFPA 70-1973; ANSI C1-1972, Article 310.

(3) Tampering with, bridging, or using oversize fuses is prohibited. If fuses blow repeatedly, employees must immediately report the trouble to you or to an authorized electrician.

(4) Attempting to start electric motors that kick out repeatedly is prohibited.

[Recodified as § 296-307-36418, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36418, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36421 How must equipment be installed in wet locations? (1) Cabinets, cutout boxes, fittings, boxes, and panelboard enclosures in damp or wet locations must be installed to prevent moisture or water from entering and accumulating within the enclosures. In wet locations the enclosures must be weatherproof.

(2) Switches, circuit breakers, and switchboards installed in wet locations must be enclosed in weatherproof enclosures.

[Recodified as § 296-307-36421, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36421, filed 10/31/96, effective 12/1/96.]

WAC 296-307-366 Wiring design and protection.

[Recodified as § 296-307-366, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-366, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36603 How must grounded and grounding conductors be used and identified? (1) A conductor used as a grounded conductor must be identified separately from all other conductors. A conductor used as an equipment grounding conductor must be identified separately from all other conductors.

(2) A grounded conductor must not be attached to any terminal or lead to reverse the designated polarity.

(3) Using a grounding terminal or grounding-type device on a receptacle, cord connector, or attachment plug for anything other than grounding is prohibited.

[Recodified as § 296-307-36603, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36603, filed 10/31/96, effective 12/1/96.]

(1999 Ed.)

WAC 296-307-36606 What ampere rating must outlet devices have? Outlet devices must have an ampere rating at least equal to the load served.

[Recodified as § 296-307-36606, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36606, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36609 What requirements apply to conductors? This section applies to branch circuit, feeder, and service conductors rated 600 volts, nominal, or less and run outdoors as open conductors.

(1) Conductors supported on poles must provide a horizontal climbing space of at least the following:

(a) For power conductors below communication conductors, 30 inches.

(b) For power conductors alone or above communication conductors:

- 300 volts or less, 24 inches;
- More than 300 volts, 30 inches.

(c) For communication conductors below power conductors with power conductors of:

- 300 volts or less, 24 inches;
- More than 300 volts, 30 inches.

(2) Open conductors must provide at least the following minimum clearances:

(a) 10 feet, above finished grade, sidewalks, or from any platform or projection from which they might be reached;

(b) 12 feet, over areas subject to vehicular traffic other than truck traffic;

(c) 15 feet, over areas that are subject to truck traffic; except

(d) 18 feet, over public streets, alleys, roads, and driveways.

(3) Conductors must have a clearance of at least 3 feet from windows, doors, porches, fire escapes, or similar locations. Conductors run above the top level of a window are considered to be out of reach from that window and, therefore, do not have to be 3 feet away.

(4) Conductors must have a clearance of at least 8 feet from the highest point of roofs they pass over.

Exceptions:

(a) Where the voltage between conductors is 300 volts or less and the roof has a slope of at least 4 inches in 12, the clearance from the roofs must be at least 3 feet; or

(b) Where the voltage between conductors is 300 volts or less, the conductors do not pass over more than 4 feet of the overhang portion of the roof, and they are terminated at a through-the-roof raceway or approved support, the clearance from the roofs must be at least 18 inches.

(5) Lamps for outdoor lighting must be located below all live conductors, transformers, or other electric equipment, unless such equipment is controlled by a disconnecting means that can be locked in the open position or unless adequate clearances or other safeguards are provided for relamping operations.

[Recodified as § 296-307-36609, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36609, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36612 What design and protection requirements apply to service-entrances? (1) Disconnect-

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ing means for service-entrances must meet the following requirements:

(a) Means must be provided to disconnect all conductors in a building or other structure from the service-entrance conductors. The disconnecting means must plainly indicate whether it is in the open or closed position and must be installed at a readily accessible location nearest the point of entrance of the service-entrance conductors.

(b) Each service disconnecting means must disconnect all ungrounded conductors at the same time.

(2) The following additional requirements apply to services over 600 volts, nominal.

(a) Service-entrance conductors installed as open wires must be guarded to make them accessible only to qualified persons.

(b) Signs warning of high voltage must be posted where other than qualified employees might come in contact with live parts.

[Recodified as § 296-307-36612. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36612, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36615 What overcurrent protection must be provided? (1) The following requirements apply to overcurrent protection of circuits rated 600 volts, nominal, or less.

(a) Conductors and equipment must be protected from overcurrent according to their ability to safely conduct current.

(b) Except for motor running overload protection, overcurrent devices must not interrupt the continuity of the grounded conductor unless all conductors of the circuit are opened at the same time.

(c) Except for service fuses, all cartridge fuses that are accessible to other than qualified persons and all fuses and thermal cutouts on circuits over 150 volts to ground must have disconnecting means. This disconnecting means must be installed so that the fuse or thermal cutout can be disconnected from its supply without disrupting service to equipment and circuits unrelated to those protected by the overcurrent device.

(d) Overcurrent devices must be readily accessible to each employee or authorized building management personnel. These overcurrent devices must be located where they will be protected against physical damage and away from easily ignitable material.

(e) Fuses and circuit breakers must be located or shielded so that employees will not be burned or otherwise injured by their operation.

(f) Circuit breakers must meet the following requirements:

(i) Circuit breakers must clearly indicate whether they are in the open (off) or closed (on) position.

(ii) Where circuit breaker handles on switchboards are operated vertically rather than horizontally or rotationally, the up position of the handle must be the closed (on) position.

(iii) If used as switches in 120-volt, fluorescent lighting circuits, circuit breakers must be approved for the purpose and marked "SWD."

(2) Feeders and branch circuits over 600 volts, nominal, must have short-circuit protection.

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[Recodified as § 296-307-36615. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36615, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36618 What premises wiring systems must be grounded? The following systems that supply premises wiring must be grounded:

(1) All 3-wire DC systems must have their neutral conductor grounded.

(2) Two-wire DC systems operating at 50-300 volts between conductors must be grounded.

Exceptions:

This requirement does not apply if:

(a) They supply only industrial equipment in limited areas and are equipped with a ground detector; or

(b) They are rectifier-derived from an AC system that meets the requirements of subsections (3), (4), and (5) of this section; or

(c) They are fire-protective signaling circuits with a maximum current of 0.030 amperes.

(3) AC circuits of less than 50 volts must be grounded if they are installed as overhead conductors outside of buildings or if they are supplied by transformers and the transformer primary supply system is ungrounded or exceeds 150 volts to ground.

(4) AC systems of 50-1000 volts must be grounded under any of the following conditions:

(a) If the system can be grounded so that the maximum voltage to ground on the ungrounded conductors is a maximum of 150 volts;

(b) If the system is nominally rated 480Y/277 volt, 3-phase, 4-wire in which the neutral is used as a circuit conductor;

(c) If the system is nominally rated 240/120 volt, 3-phase, 4-wire in which the midpoint of one phase is used as a circuit conductor; or

(d) If a service conductor is uninsulated.

(5) Exceptions: AC systems of 50-1000 volts are not required to be grounded under any of the following conditions:

(a) If the system is used exclusively to supply industrial electric furnaces for melting, refining, tempering, and the like.

(b) If the system is separately derived and is used exclusively for rectifiers supplying only adjustable speed industrial drives.

(c) If the system is separately derived and is supplied by a transformer that has a primary voltage rating less than 1000 volts, if all of the following conditions are met:

(i) The system is used exclusively for control circuits;

(ii) The conditions of maintenance and supervision ensure that only qualified persons will service the installation;

(iii) Continuity of control power is required; and

(iv) Ground detectors are installed on the control system.

[Recodified as § 296-307-36618. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36618, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36621 Must the conductor be grounded for AC premises wiring? For AC premises wiring systems the identified conductor must be grounded.

(1999 Ed.)

[Recodified as § 296-307-36621, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36621, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36624 What general requirements apply to grounding conductors? (1) For a grounded system, a grounding electrode conductor must be used to connect both the equipment grounding conductor and the grounded circuit conductor to the grounding electrode. Both the equipment grounding conductor and the grounding electrode conductor must be connected to the grounded circuit conductor on the supply side of the service disconnecting means, or on the supply side of the system disconnecting means or overcurrent devices if the system is separately derived.

(2) For an ungrounded service-supplied system, the equipment grounding conductor must be connected to the grounding electrode conductor at the service equipment. For an ungrounded separately derived system, the equipment grounding conductor must be connected to the grounding electrode conductor at, or ahead of, the system disconnecting means or overcurrent devices.

(3) On extensions of existing branch circuits that do not have an equipment grounding conductor, grounding-type receptacles may be grounded to a grounded cold water pipe near the equipment.

[Recodified as § 296-307-36624, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36624, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36627 Must the path to ground be continuous? The path to ground from circuits, equipment, and enclosures must be permanent and continuous.

[Recodified as § 296-307-36627, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36627, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36630 What supports, enclosures, and equipment must be grounded? (1) Metal cable trays, metal raceways, and metal enclosures for conductors must be grounded.

Exceptions:

(a) Metal enclosures such as sleeves that are used to protect cable assemblies from physical damage need not be grounded; or

(b) Metal enclosures for conductors added to existing installations of open wire, knob-and-tube wiring, and nonmetallic-sheathed cable need not be grounded if all of the following conditions are met:

(i) Runs are less than 25 feet;

(ii) Enclosures are free from probable contact with ground, grounded metal, metal laths, or other conductive materials; and

(iii) Enclosures are guarded against employee contact.

(2) Metal enclosures for service equipment must be grounded.

(3) Frames of electric ranges, wall-mounted ovens, counter-mounted cooking units, clothes dryers, and metal outlet or junction boxes that are part of the circuit for these appliances must be grounded.

(4) Exposed noncurrent-carrying metal parts of fixed equipment that may become energized must be grounded under any of the following conditions:

(a) If within 8 feet vertically or 5 feet horizontally of ground or grounded metal objects and subject to employee contact;

(1999 Ed.)

(b) If located in a wet or damp location and not isolated;

(c) If in electrical contact with metal;

(d) If in a hazardous (classified) location;

(e) If supplied by a metal-clad, metal-sheathed, or grounded metal raceway wiring method;

(f) If equipment operates with any terminal at over 150 volts to the ground; however, the following need not be grounded:

(i) Enclosures for switches or circuit breakers used for other than service equipment and accessible to qualified persons only;

(ii) Metal frames of electrically heated appliances that are permanently and effectively insulated from ground; and

(iii) The cases of distribution apparatus such as transformers and capacitors mounted on wooden poles that are over 8 feet above ground or grade level.

(5) Under any of the conditions below, exposed noncurrent-carrying metal parts of cord-connected and plug-connected equipment that may become energized must be grounded.

(a) When equipment is in hazardous (classified) locations.

(b) When equipment is operated at over 150 volts to ground.

Exception:

Guarded motors and metal frames of electrically heated appliances need not be grounded if the appliance frames are permanently and effectively insulated from ground.

(c) When equipment is one of the following:

- Refrigerators, freezers, and air conditioners;
- Clothes-washing, clothes-drying and dishwashing machines, sump pumps, and electrical aquarium equipment;
- Hand-held motor-operated tools;
- The following motor-operated appliances: Hedge clip-pers, lawn mowers, snow blowers, and wet scrubbers;
- Cord-connected and plug-connected appliances used in damp or wet locations or by employees standing on the ground or on metal floors or working inside of metal tanks or boilers;
- Tools likely to be used in wet and conductive locations; and
- Portable hand lamps.

Tools likely to be used in wet and conductive locations need not be grounded if supplied through an isolating transformer with an ungrounded secondary of a maximum of 50 volts. Listed or labeled portable tools and appliances protected by an approved system of double insulation, or its equivalent, need not be grounded. The equipment must be distinctively marked to indicate that the tool or appliance uses an approved system of double insulation.

(6) The metal parts of the following nonelectrical equipment must be grounded: Frames and tracks of electrically operated cranes; frames of nonelectrically driven elevator cars to which electric conductors are attached; hand operated metal shifting ropes or cables of electric elevators, and metal partitions, grill work, and other metal enclosures around equipment of over 750 volts between conductors.

[Recodified as § 296-307-36630, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36630, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36633 How must fixed equipment be grounded? (1) Noncurrent-carrying metal parts of fixed equipment, if required to be grounded by this section, must be grounded by an equipment grounding conductor that is contained within the same raceway, cable, or cord, or runs with or encloses the circuit conductors. For DC circuits only, the equipment grounding conductor may be run separately from the circuit conductors.

(2) Electric equipment is considered grounded if it is secured to, and in electrical contact with, a metal rack or structure that is provided for its support and the metal rack or structure is grounded as described above.

For installations made before May 30, 1982, electric equipment is also considered grounded if it is secured to, and in metallic contact with, the grounded structural metal frame of a building. Metal car frames supported by metal hoisting cables attached to or running over metal sheaves or drums of grounded elevator machines are also considered grounded.

[Recodified as § 296-307-36633. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36633, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36636 How must high voltage systems be grounded? Grounded high voltage (1000 volts or more) systems and circuits must meet all requirements of WAC 296-307-366 and the additional requirements of this section.

(1) Systems supplying portable or mobile high voltage equipment, other than substations installed on a temporary basis, must meet the following requirements:

(a) Portable and mobile high voltage equipment must be supplied from a system having its neutral grounded through an impedance. If a delta-connected high voltage system is used to supply the equipment, a system neutral must be derived.

(b) Exposed noncurrent-carrying metal parts of portable and mobile equipment must be connected by an equipment grounding conductor to the point at which the system neutral impedance is grounded.

(c) Ground-fault detection and relaying must be provided to automatically deenergize any high voltage system component that has developed a ground fault. The continuity of the equipment grounding conductor must be continuously monitored to deenergize automatically the high voltage feeder to the portable equipment on loss of continuity of the equipment grounding conductor.

(d) The grounding electrode to which the portable or mobile equipment system neutral impedance is connected must be isolated from and separated in the ground by at least 20 feet from any other system or equipment grounding electrode. There must be no direct connection between the grounding electrodes, such as buried pipe, fence, etc.

(2) All noncurrent-carrying metal parts of portable equipment and fixed equipment including their associated fences, housings, enclosures, and supporting structures shall be grounded. However, equipment that is guarded by location and isolated from ground need not be grounded. Additionally, pole-mounted distribution apparatus over 8 feet above ground or grade level need not be grounded.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-36636, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-36636. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050

and [49.17.]060. 96-22-048, § 296-306A-36636, filed 10/31/96, effective 12/1/96.]

WAC 296-307-368 Wiring methods, components, and equipment for general use.

[Recodified as § 296-307-368. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-368, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36803 Does this section apply to factory-assembled equipment? WAC 296-307-368 does not apply to conductors that are an integral part of factory-assembled equipment.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-36803, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-36803. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-307-36803, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36806 What wiring methods must be used for temporary wiring? Temporary electrical power and lighting wiring methods may be of a class less than would be required for a permanent installation. All requirements for permanent wiring apply to temporary wiring installations, except as indicated in this section.

(1) Temporary electrical power and lighting installations 600 volts, nominal, or less must only be used:

(a) During and for remodeling, maintenance, repair, or demolition of buildings, structures, or equipment, and similar activities;

(b) For experimental or development work; and

(c) For a maximum of 90 days for Christmas lighting and similar purposes.

(2) Temporary wiring over 600 volts, nominal, must only be used during periods of tests, experiments, or emergencies.

(3) General requirements for temporary wiring.

(a) Working spaces, walkways, and similar locations must be kept clear of power cords.

(b) All temporary wiring must be grounded. (See NFPA 70 Art. 250.)

(c) All wiring equipment must be maintained as vapor-tight, dust-tight, or fiber-tight as their approval requires. There must be no loose or missing screws, gaskets, threaded connections, or other conditions that impair the required tightness.

(d) Take precautions to make necessary open wiring accessible only to authorized personnel.

(e) Feeders must originate in an approved distribution center. The conductors must be run as multiconductor cord or cable assemblies, or, where not subject to physical damage, they may be run as open conductors on insulators not more than 10 feet apart.

(f) Branch circuits must originate in an approved power outlet or panelboard. Conductors must be multiconductor cord or cable assemblies or open conductors. If run as open conductors they must be fastened at ceiling height every 10 feet. A branch-circuit conductor must not be laid on the floor. Each branch circuit that supplies receptacles or fixed equipment must have a separate equipment grounding conductor if run as open conductors.

(g) Receptacles must be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit

must have a separate equipment grounding conductor and all receptacles must be electrically connected to the grounding conductor.

(h) A bare conductor or an earth return must not be used to wire any temporary circuit.

(i) Suitable disconnecting switches or plug connectors must be installed to permit the disconnection of all ungrounded conductors of each temporary circuit.

(j) Lamps for general illumination must be protected from accidental contact or breakage. Lamps must be elevated at least 7 feet from normal working surface or by a suitable fixture or lampholder with a guard.

(k) Flexible cords and cables must be protected from accidental damage. Sharp corners and projections must be avoided. Where passing through doorways or other pinch points, flexible cords and cables must be protected to avoid damage.

(4) General requirements for temporary lighting.

(a) Temporary lights must have guards to prevent accidental contact with the bulb.

Note: Guards are not required when the entire bulb is below the rim and completely surrounded and protected by the reflector.

(b) Temporary lights must have heavy duty electric cords with connections and insulation maintained in safe condition.

(c) Temporary lights must not be suspended by their electric cords unless cords and lights are designed for suspension.

(d) Brass shell, paper-lined lamp holders are prohibited.

(e) Portable extension lamps used where flammable vapors or gases, combustible dusts, or easily ignitable fibers or flyings are present, must be specifically approved as complete assemblies for the type of hazard.

[Recodified as § 296-307-36086, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-307-36806, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36809 When may cable trays be used?

(1) Only the following may be installed in cable tray systems:

- (a) Mineral-insulated metal-sheathed cable (Type MI);
- (b) Armored cable (Type AC);
- (c) Metal-clad cable (Type MC);
- (d) Power-limited tray cable (Type PLTC);
- (e) Nonmetallic-sheathed cable (Type NM or NMC);
- (f) Shielded nonmetallic-sheathed cable (Type SNM);
- (g) Multiconductor service-entrance cable (Type SE or USE);

(h) Multiconductor underground feeder and branch-circuit cable (Type UF);

(i) Power and control tray cable (Type TC);

(j) Other factory-assembled, multiconductor control, signal, or power cables that are specifically approved for installation in cable trays; or

(k) Any approved conduit or raceway with its contained conductors.

(2) In industrial establishments only, where conditions of maintenance and supervision ensure that only qualified persons will service the installed cable tray system, the following cables may also be installed in ladder, ventilated trough, or 4 inch ventilated channel-type cable trays:

(1999 Ed.)

Single conductor cables that are 250 MCM or larger and are Types RHH, RHW, MV, USE, or THW, and other 250 MCM or larger single conductor cables if specifically approved for installation in cable trays. Where exposed to direct rays of the sun, cables must be sunlight-resistant.

(3) Cable trays in hazardous (classified) locations must contain only the cable types permitted in such locations.

Exception: Cable tray systems must not be used in hoistways or where subjected to severe physical damage.

[Recodified as § 296-307-36809, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36809, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36812 What requirements apply to open wiring on insulators? (1) Open wiring on insulators is only permitted on systems of 600 volts, nominal, or less for industrial or agricultural establishments and for services.

(2) Conductors must be rigidly supported on noncombustible, nonabsorbent insulating materials and must not contact any other objects.

(3) In dry locations with no exposure to severe physical damage, conductors may be separately enclosed in flexible nonmetallic tubing. The tubing must be in continuous lengths a maximum of 15 feet and secured to the surface by straps at maximum intervals of 4 feet 6 inches.

(4) Open conductors must be separated from contact with walls, floors, and wood cross members, or partitions through which they pass by tubes or bushings of noncombustible, nonabsorbent insulating material. If the bushing is shorter than the hole, a waterproof sleeve of nonconductive material must be inserted in the hole and an insulating bushing slipped into the sleeve at each end to keep the conductors completely out of contact with the sleeve. Each conductor must be carried through a separate tube or sleeve.

(5) Conductors within 7 feet of the floor are considered exposed to physical damage. Where open conductors cross ceiling joints and wall studs and are exposed to physical damage, they must be protected.

[Recodified as § 296-307-36812, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36812, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36815 What wiring requirements apply to cabinets, boxes, and fittings? (1) Conductors entering boxes, cabinets, or fittings must be protected from abrasion, and openings through which conductors enter must be closed. Unused openings in cabinets, boxes, and fittings must also be closed.

(2) All pull boxes, junction boxes, and fittings must have covers approved for the purpose. All metal covers must be grounded. In completed installations each outlet box must have a cover, faceplate, or fixture canopy. A cover of an outlet box with holes through which a flexible cord pendant passes must have bushings designed for the purpose or have a smooth, well-rounded surface for the cord to run on.

(3) All pull and junction boxes for systems over 600 volts, nominal, must meet the following requirements:

(a) Boxes must provide a complete enclosure for the contained conductors or cables.

(b) Boxes must be closed by suitable covers securely fastened in place. Underground box covers that weigh over 100

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pounds meet this requirement. Covers for boxes must be permanently marked "HIGH VOLTAGE." The marking must be on the outside of the box cover and must be readily visible and legible.

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WAC 296-307-36818 What requirements apply to switches? (1) Single-throw knife switches must be connected so that the blades are dead when the switch is in the open position. Single-throw knife switches must be placed so that gravity will not tend to close them. Single-throw knife switches approved for use in the inverted position must have a locking device that keeps the blades open when set. Double-throw knife switches may be mounted so that the throw will be either vertical or horizontal. However, if the throw is vertical a locking device must be provided to ensure that the blades remain open when so set.

(2) Flush snap switches that are mounted in ungrounded metal boxes and located within reach of conducting floors or other conducting surfaces must have faceplates of nonconducting, noncombustible material.

[Recodified as § 296-307-36818. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36818, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36821 Where must switchboards and panelboards be located? Switchboards that have any exposed live parts must be located in permanently dry locations and accessible only to qualified persons. Panelboards must be mounted in cabinets, cutout boxes, or enclosures approved for the purpose and must be dead front. However, panelboards other than the dead front externally operable type are permitted where accessible only to qualified persons. Exposed blades of knife switches must be dead when open.

[Recodified as § 296-307-36821. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36821, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36824 When must conductors be insulated? All conductors used for general wiring must be insulated unless otherwise permitted in this section. The conductor insulation must be approved for the voltage, operating temperature, and location of use. Insulated conductors must be distinguishable by appropriate color or other means as grounded conductors, ungrounded conductors, or equipment grounding conductors.

[Recodified as § 296-307-36824. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36824, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36827 When may flexible cords and cables be used? (1) Flexible cords and cables must be approved and suitable for conditions of use and location. Flexible cords and cables must be used only for:

- (a) Pendants;
- (b) Wiring of fixtures;
- (c) Connection of portable lamps or appliances;
- (d) Elevator cables;
- (e) Wiring of cranes and hoists;

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(f) Connection of stationary equipment to facilitate frequent interchange;

(g) Prevention of the transmission of noise or vibration;

(h) Appliances where the fastening means and mechanical connections are designed to permit removal for maintenance and repair; or

(i) Data processing cables approved as a part of the data processing system.

(2) If used as permitted above, the flexible cord must have an attachment plug and shall be energized from an approved receptacle outlet.

(3) Unless permitted in subsection (1) of this section, flexible cords and cables must not be used:

(a) As a substitute for the fixed wiring of a structure;

(b) Where run through holes in walls, ceilings, or floors;

(c) Where run through doorways, windows, or similar openings;

(d) Where attached to building surfaces; or

(e) Where concealed behind building walls, ceilings, or floors.

(4) Flexible cords used in show windows and showcases must be Type S, SO, SJ, SJO, ST, STO, SJT, SJTO, or AFS except for the wiring of chain-supported lighting fixtures and supply cords for portable lamps and other merchandise being displayed or exhibited.

[Recodified as § 296-307-36827. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36827, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36830 How must flexible cords and cables be identified, spliced, and terminated? (1) A conductor of a flexible cord or cable that is used as a grounded conductor or an equipment grounding conductor must be distinguishable from other conductors. Types SJ, SJO, SJT, SJTO, S, SO, ST, and STO must be durably marked on the surface with the type designation, size, and number of conductors.

(2) Flexible cords must be used only in continuous lengths without splice or tap. Vulcanized splices or equivalent means such as systems using shrinkable materials may be used to repair flexible cords. Hard service flexible cords No. 12 or larger may be repaired by splice if the splice retains the insulation, outer sheath properties, and usage characteristics of the cord being spliced.

(3) Flexible cords must be connected to devices and fittings so that strain relief is provided to prevent pull from being directly transmitted to joints or terminal screws.

[Recodified as § 296-307-36830. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36830, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36833 What requirements apply to multiconductor portable cable? Multiconductor portable cable for use in supplying power to portable or mobile equipment at over 600 volts, nominal, must consist of No. 8 or larger conductors employing flexible stranding. Cables operated at over 2,000 volts must be shielded to confine the voltage stresses to the insulation. Grounding conductors must be provided. Connectors for these cables must be locking with provisions to prevent their opening or closing while energized. Strain relief must be provided at connections and ter-

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minations. Portable cables must not be operated with splices unless the splices are permanent molded, vulcanized, or other approved type. Termination enclosures must be suitably marked with a high voltage hazard warning, and terminations must be accessible only to authorized and qualified personnel.

[Recodified as § 296-307-36833. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36833, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36836 When may fixture wires be used? (1) A fixture wire must be approved for the voltage, temperature, and location of use. A fixture wire used as a grounded conductor must be identified.

(2) Fixture wires may be used:

(a) For installation in lighting fixtures and in similar equipment where enclosed or protected and not subject to bending or twisting in use; or

(b) For connecting lighting fixtures to the branch-circuit conductors supplying the fixtures.

(3) Fixture wires must not be used as branch-circuit conductors except as permitted for Class 1 power limited circuits.

[Recodified as § 296-307-36836. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36836, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36839 What requirements apply to wiring for lighting fixtures, lampholders, lamps, and receptacles? (1) Fixtures, lampholders, lamps, rosettes, and receptacles must have no live parts normally exposed to employee contact. However, rosettes and cleat-type lampholders and receptacles located at least 8 feet above the floor may have exposed parts.

(2) Handlamps of the portable type supplied through flexible cords must have a handle of molded composition or other material approved for the purpose, and a substantial guard must be attached to the lampholder or the handle.

(3) Lampholders of the screw-shell type must be installed for use as lampholders only. Lampholders installed in wet or damp locations must be weatherproof.

(4) Fixtures installed in wet or damp locations must be approved for the purpose and must be constructed or installed so that water cannot enter or accumulate in wireways, lampholders, or other electrical parts.

[Recodified as § 296-307-36839. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36839, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36842 What requirements apply to wiring for receptacles, cord connectors, and attachment plugs (caps)? (1) Receptacles, cord connectors, and attachment plugs must be constructed so that no receptacle or cord connector will accept an attachment plug with a different voltage or current rating than that for which the device is intended. However, a 20-ampere T-slot receptacle or cord connector may accept a 15-ampere attachment plug of the same voltage rating.

(2) A receptacle installed in a wet or damp location must be suitable for the location.

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[Recodified as § 296-307-36842. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36842, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36845 What requirements apply to wiring for appliances? (1) Appliances, other than those in which the current-carrying parts at high temperatures are necessarily exposed, must have no live parts normally exposed to employee contact.

(2) Each appliance must have a disconnecting means.

(3) Each appliance must be marked with its rating in volts and amperes or volts and watts.

[Recodified as § 296-307-36845. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36845, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36848 What requirements apply to wiring for motors, motor circuits, and controllers? (1) If specified that one piece of equipment must be "in sight from" another piece of equipment, one shall be visible and not more than 50 feet from the other.

(2) Disconnecting means must meet the following requirements:

(a) A disconnecting means must be located in sight from the controller location. However, a single disconnecting means may be located adjacent to a group of coordinated controllers mounted adjacent to each other or a multimotor continuous process machine. The controller disconnecting means for motor branch circuits over 600 volts, nominal, may be out of sight of the controller, if the controller is marked with a warning label giving the location and identification of the disconnecting means which is to be locked in the open position.

(b) The disconnecting means must disconnect the motor and the controller from all ungrounded supply conductors and must be designed so that no pole can be operated independently.

(c) If a motor and the driven machinery are not in sight from the controller location, the installation must meet one of the following conditions:

(i) The controller disconnecting means must be able to be locked in the open position.

(ii) A manually operable switch that will disconnect the motor from its source of supply must be placed in sight from the motor location.

(d) The disconnecting means must plainly indicate whether it is in the open (off) or closed (on) position.

(e) The disconnecting means must be readily accessible. If more than one disconnect is provided for the same equipment, only one need be readily accessible.

(f) An individual disconnecting means must be provided for each motor, but a single disconnecting means may be used for a group of motors under any of the following conditions:

(i) If a number of motors drive special parts of a single machine or piece of apparatus, such as a metal or woodworking machine, crane, or hoist; or

(ii) If a group of motors is under the protection of one set of branch-circuit protective devices; or

(iii) If a group of motors is in a single room in sight from the location of the disconnecting means.

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(3) Motors, motor-control apparatus, and motor branch-circuit conductors must be protected against overheating from motor overloads or failure to start, and against short-circuits or ground faults. Overload protection is not required if it will stop a motor where a shutdown is likely to introduce additional or increased hazards, as in the case of fire pumps, or where continued operation of a motor is necessary for a safe shutdown of equipment or process and motor overload sensing devices are connected to a supervised alarm.

(4) Live parts of all voltages must be protected according to the following:

(a) Stationary motors with commutators, collectors, and brush rigging located inside of motor end brackets and not conductively connected to supply circuits operating at more than 150 volts to ground may have those parts unguarded. Exposed live parts of motors and controllers operating at 50 volts or more between terminals must be guarded against accidental contact by any of the following:

(i) By installation in a room or enclosure that is accessible only to qualified persons;

(ii) By installation on a suitable balcony, gallery, or platform, elevated and arranged to exclude unqualified persons; or

(iii) By elevation 8 feet or more above the floor.

(b) Where live parts of motors or controllers operating at over 150 volts to ground are guarded against accidental contact only by location, and where adjustment or other attendance may be necessary during the operation of the apparatus, suitable insulating mats or platforms must be provided so that the attendant cannot readily touch live parts unless standing on the mats or platforms.

[Recodified as § 296-307-36848. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36848, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36851 What requirements apply to wiring for transformers? (1) This section applies to the installation of all transformers.

Exception:

- (a) Current transformers;
- (b) Dry-type transformers installed as a component part of other apparatus;
- (c) Transformers that are an integral part of a high frequency or electrostatic-coating apparatus;
- (d) Transformers used with Class 2 and Class 3 circuits, sign and outline lighting, electric discharge lighting, and power-limited fire-protective signaling circuits; and
- (e) Liquid-filled or dry-type transformers used for research, development, or testing, where effective safeguard arrangements are provided.

(2) The operating voltage of exposed live parts of transformer installations must be indicated by warning signs or visible markings on the equipment or structure.

(3) Dry-type, high fire point liquid-insulated, and askarel-insulated transformers installed indoors and rated over 35kV must be in a vault.

(4) If they present a fire hazard to employees, oil-insulated transformers installed indoors must be in a vault.

(5) Combustible material, combustible buildings and parts of buildings, fire escapes, and door and window openings must be safeguarded from fires that may originate in oil-insulated transformers attached or adjacent to a building or combustible material.

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(6) Transformer vaults must be constructed to contain fire and combustible liquids within the vault and to prevent unauthorized access. Locks and latches must be arranged so that a vault door can be readily opened from the inside.

(7) Any pipe or duct system foreign to the vault installation must not enter or pass through a transformer vault.

(8) Materials must not be stored in transformer vaults.

[Recodified as § 296-307-36851. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36851, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36854 What requirements apply to wiring for capacitors? (1) All capacitors, except surge capacitors or capacitors included as a component part of other apparatus, must have an automatic means of draining the stored charge after the capacitor is disconnected from its source of supply.

(2) Capacitors rated over 600 volts, nominal, must meet the following additional requirements:

(a) Isolating or disconnecting switches (with no interrupting rating) must be interlocked with the load interrupting device or must have prominently displayed caution signs to prevent switching load current.

(b) For series capacitors, the proper switching must be ensured by any of the following:

(i) Mechanically sequenced isolating and bypass switches;

(ii) Interlocks; or

(iii) Switching procedure prominently displayed at the switching location.

[Recodified as § 296-307-36854. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36854, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36857 How must storage batteries be ventilated? You must ensure that there is sufficient diffusion and ventilation of gases from storage batteries to prevent the accumulation of explosive mixtures.

[Recodified as § 296-307-36857. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36857, filed 10/31/96, effective 12/1/96.]

WAC 296-307-36860 What other miscellaneous requirements apply to wiring methods? (1) Metal raceways, cable armor, and other metal enclosures for conductors must be metallically joined into a continuous electric conductor and must be connected to all boxes, fittings, and cabinets to provide effective electrical continuity.

(2) All wiring systems are prohibited from being installed in ducts used to transport dust, loose stock or flammable vapors. All wiring system are prohibited from being installed in any duct used for vapor removal or for ventilation of commercial-type cooking equipment, or in any shaft containing only such ducts.

[Recodified as § 296-307-36860. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-36860, filed 10/31/96, effective 12/1/96.]

WAC 296-307-370 Special purpose equipment and installations.

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[Recodified as § 296-307-370. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-370, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37003 What requirements apply to cranes, hoists, and runways? The installation of electric equipment and wiring used with cranes, monorail hoists, hoists, and all runways must meet the following requirements:

(1) Disconnecting means must meet the following requirements:

(a) A readily accessible disconnecting means is provided between the runway contact conductors and the power supply.

(b) Another disconnecting means, capable of being locked in the open position, is provided in the leads from the runway contact conductors or other power supply on any crane or monorail hoist.

(i) If this additional disconnection means is not readily accessible from the crane or monorail hoist operating station, means is provided at the operating station, to open the power circuit to all motors of the crane or monorail hoist.

(ii) The additional disconnect may be omitted if a monorail hoist or hand-propelled crane bridge installation meets all of the following:

(A) The unit is floor controlled;

(B) The unit is within view of the power supply disconnecting means; and

(C) No fixed work platform has been provided for servicing the unit.

(2) A limit switch or other device shall be provided to prevent the load block from passing the safe upper limit of travel of any hoisting mechanism.

(3) The dimension of the working space in the direction of access to live parts that may require examination, adjustment, servicing, or maintenance while alive must be a minimum of 2 feet 6 inches. Where controls are enclosed in cabinets, the door must either open at least 90 degrees or be removable.

[Recodified as § 296-307-37003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37006 What requirements apply to elevators, dumbwaiters, escalators, and moving walks?

(1) Elevators, dumbwaiters, escalators, and moving walks must have a single means for disconnecting all ungrounded main power supply conductors for each unit.

(2) If interconnections between control panels are necessary for operation of the system on a multicar installation that remains energized from a source other than the disconnecting means, a warning sign must be mounted on or adjacent to the disconnecting means. The sign must be clearly legible and shall read "Warning—Parts of the control panel are not deenergized by this switch."

(3) If control panels are not located in the same space as the drive machine, they must be located in cabinets with doors or panels capable of being locked closed.

[Recodified as § 296-307-37006. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37006, filed 10/31/96, effective 12/1/96.]

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WAC 296-307-37009 What requirements apply to the disconnecting means for electric welders? (1) A disconnecting means must be provided in the supply circuit for each motor-generator arc welder, and for each AC transformer and DC rectifier arc welder that is not equipped with a disconnect mounted as an integral part of the welder.

(2) A switch or circuit breaker must be provided by which each resistance welder and its control equipment can be isolated from the supply circuit. The ampere rating of this disconnecting means must not be less than the supply conductor ampacity.

[Recodified as § 296-307-37009. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37012 What requirements apply to electrically driven or controlled irrigation machines? (1) If an electrically driven or controlled irrigation machine has a stationary point, a driven ground rod must be connected to the machine at the stationary point for lightning protection.

(2) The main disconnecting means for a center pivot irrigation machine must be located at the point of connection of electrical power to the machine and must be readily accessible and capable of being locked in the open position. A disconnecting means must be provided for each motor and controller.

[Recodified as § 296-307-37012. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37012, filed 10/31/96, effective 12/1/96.]

WAC 296-307-372 Hazardous (classified) locations.

[Recodified as § 296-307-372. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-372, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37203 What does this section cover? WAC 296-307-372 covers the requirements for electric equipment and wiring in locations that are classified based on the properties of the flammable vapors, liquids or gases, or combustible dusts or fibers that may be present and the likelihood that a flammable combustible concentration or quantity is present. Each room, section, or area must be considered individually to determine its classification.

All requirements in this part apply to hazardous locations, unless otherwise indicated.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-37203, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-37203. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37203, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37206 What classifications apply to this section? These hazardous locations are classified as follows:

(1) "Class I locations" are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. They include the following:

(a) Class I, Division 1 locations are those where:

(i) Hazardous concentrations of flammable gases or vapors may exist under normal operating conditions; or

(ii) Hazardous concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or

(iii) Breakdown or faulty operation of equipment or processes might release hazardous concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment.

This classification usually includes locations where:

- Volatile flammable liquids or liquefied flammable gases are transferred from one container to another;
- Interiors of spray booths and areas in the vicinity of spraying and painting operations where volatile flammable solvents are used;
- Locations containing open tanks or vats of volatile flammable liquids;
- Drying rooms or compartments for the evaporation of flammable solvents;
- Locations containing fat and oil extraction equipment using volatile flammable solvents;
- Gas generator rooms and other portions of gas manufacturing plants where flammable gas may escape;
- Inadequately ventilated pump rooms for flammable gas or for volatile flammable liquids;
- The interiors of refrigerators and freezers in which volatile flammable materials are stored in open, lightly stoppered, or easily ruptured containers; and
- All other locations where ignitable concentrations of flammable vapors or gases are likely to occur in the course of normal operations.

(b) Class I, Division 2 locations are those where:

(i) Volatile flammable liquids or flammable gases are handled, processed, or used, but in which the hazardous liquids, vapors, or gases are normally confined within closed containers or systems from which they can escape only in an accidental rupture or breakdown of containers or systems, or in case of abnormal operation of equipment; or

(ii) Hazardous concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operation of the ventilating equipment; or

(iii) They are adjacent to a Class I, Division 1 location, and to which hazardous concentrations of gases or vapors might occasionally be communicated unless prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

This classification usually includes locations where:

• Volatile flammable liquids or flammable gases or vapors are used, but which would become hazardous only in case of an accident or unusual operating condition. The quantity of flammable material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the record of the industry or business with respect to explosions or fires are all factors to consider in determining the classification.

• Piping without valves, checks, meters, and similar devices would not ordinarily introduce a hazardous condition even though used for flammable liquids or gases. Locations used for the storage of flammable liquids or a liquefied or compressed gases in sealed containers are not normally con-

sidered hazardous unless also subject to other hazardous conditions.

• Electrical conduits and their enclosures separated from process fluids by a single seal or barrier are Division 2 locations if the outside of the conduit and enclosures is a nonhazardous location.

(2) "Class II locations" are those that are hazardous because of the presence of combustible dust. They include the following:

(a) Class II, Division 1 locations are those where:

(i) Combustible dust is or may be suspended in the air under normal operating conditions, in quantities sufficient to produce explosives or ignitable mixtures; or

(ii) Mechanical failure or abnormal operation of machinery or equipment might produce explosive or ignitable, and might also provide a source of ignition through simultaneous failure of electric equipment, operation of protection devices, or from other causes; or

(iii) Combustible dusts of an electrically conductive nature may be present.

This classification may include areas of grain handling and processing plants, starch plants, sugar-pulverizing plants, malting plants, hay-grinding plants, coal pulverizing plants, areas where metal dusts and powders are produced or processed, and other similar locations that contain dust producing machinery and equipment (except where the equipment is dust-tight or vented to the outside). These areas would have combustible dust in the air, under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures.

Combustible dusts that are electrically nonconductive include dusts produced in the handling and processing of grain and grain products, pulverized sugar and cocoa, dried egg and milk powders, pulverized spices, starch and pastes, potato and wood flour, oil meal from beans and seed, dried hay, and other organic materials that may produce combustible dusts when processed or handled. Dusts containing magnesium or aluminum are particularly hazardous and the use of extreme caution is necessary to avoid ignition and explosion.

(b) Class II, Division 2 location are those where:

(i) Combustible dust is not normally suspended in the air in quantities sufficient to produce explosive or ignitable mixtures; and dust accumulations are normally insufficient to interfere with the normal operation of electrical equipment or other apparatus; or

(ii) Dust may be in suspension in the air as a result of infrequent malfunctioning of handling or processing equipment, and resulting dust accumulations may be ignitable by abnormal operation or failure of electrical equipment or other apparatus.

This classification includes locations where dangerous concentrations of suspended dust would not be likely but where dust accumulations might form on or in the vicinity of electric equipment. These areas may contain equipment from which appreciable quantities of dust would escape under abnormal operating conditions or be adjacent to a Class II Division 1 location into which an explosive or ignitable concentration of dust may be suspended under abnormal operating conditions.

(3) "Class III locations" are those that are hazardous because of the presence of easily ignitable fibers or flyings but in which such fibers or flyings are not likely to be suspended in the air in quantities sufficient to produce ignitable mixtures. They include the following:

(a) Class III, Division 1 locations are those where easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.

Such locations usually include combustible fiber manufacturing and processing plants; cotton gins and cottonseed mills; flax-processing plants; and industries involving similar hazardous processes or conditions.

Easily ignitable fibers and flyings include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fiber, oakum, baled waste kapok, Spanish moss, excelsior, and other materials of similar nature.

(b) Class III, Division 2 locations are those where easily ignitable fibers are stored or handled, except in process of manufacture.

[Recodified as § 296-307-37206. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37206, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37209 What equipment, wiring methods, and installations may be used in hazardous locations? Equipment, wiring methods, and installations of equipment in hazardous locations must be intrinsically safe, or approved for the hazardous location, or safe for the hazardous location. Requirements for each of these options are as follows:

(1) Equipment and associated wiring approved as intrinsically safe are permitted in any hazardous location for which it is approved.

(2) Requirements to be approved for the hazardous location:

(a) Equipment must be approved for the class of location and for the ignitable or combustible properties of the specific gas, vapor, dust, or fiber that will be present.

(b) Equipment must be marked to show the class, group, and operating temperature or temperature range, based on operation in a 40 degrees C ambient, for which it is approved. The temperature marking must be a maximum of the ignition temperature of the specific gas or vapor to be encountered. The following provisions apply to specific equipment:

(i) Nonheat-producing equipment, such as junction boxes, conduit, and fittings, and heat-producing equipment with a maximum temperature of 100 degrees C (212 degrees F) need not have a marked operating temperature or temperature range.

(ii) Fixed lighting fixtures marked for use in Class I, Division 2 locations only, need not be marked to indicate the group.

(iii) Fixed general-purpose equipment in Class I locations (other than lighting fixtures) that is acceptable for use in Class I, Division 2 locations need not be marked with the class, group, division, or operating temperature.

(iv) Fixed dust-tight equipment (other than lighting fixtures) that is acceptable for use in Class II, Division 2 and

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Class III locations need not be marked with the class, group, division, or operating temperature.

(3) Equipment that is safe for the location shall be of a type and design that provides protection from the hazards arising from combustible and flammable vapors, liquids, gases, dusts, or fibers.

Note: Equipment that meets the requirements of The National Electrical Code, NFPA 70, shall be considered in compliance with the requirements of WAC 296-307-372.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-37209, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-37209. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37209, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37212 How must conduit be installed in hazardous locations? All conduits must be threaded and wrench-tight. Where it is impractical to make a threaded joint tight, a bonding jumper must be used.

[Recodified as § 296-307-37212. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37212, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37215 Which equipment may be used in Division 1 and 2 locations? Equipment that has been approved for a Division 1 location may be installed in a Division 2 location of the same class and group. General-purpose equipment or equipment in general-purpose enclosures may be installed in Division 2 locations if the equipment does not constitute a source of ignition under normal operating conditions.

[Recodified as § 296-307-37215. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37215, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37218 What requirements apply to motors and generators used in hazardous locations? In Class I, Division 1 locations, motors, generators and other rotating electric machinery must be:

(1) Approved for Class I, Division 1 locations (explosion-proof); or

(2) Of the totally enclosed type supplied with positive-pressure ventilation from a source of clean air with discharge to a safe area, arranged to prevent energizing of the machine until ventilation has been established and the enclosure has been purged with at least 10 volumes of air, and also arranged to automatically deenergize the equipment when the air supply fails; or

(3) Of the totally enclosed inert-gas-filled type supplied with a suitable reliable source of inert gas for pressuring the enclosure, with devices provided to ensure a positive pressure in the enclosure and arranged to automatically deenergize the equipment when the gas supply fails; or

(4) Of a type designed to be submerged in a liquid that is flammable only when vaporized and mixed with air, or in a gas or vapor at a pressure greater than atmospheric and which is flammable only when mixed with air; and the machine is arranged to prevent energizing it until it has been purged with the liquid or gas to exclude air, and also arranged to automatically deenergize the equipment when the supply of liquid, or gas or vapor fails or the pressure is reduced to atmospheric.

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Totally enclosed type (2) and (3) motors must have no external surface with a Celsius operating temperature greater than 80% of the ignition temperature of the gas or vapor involved, as determined by ASTM test procedure (Designation: D-2155-69). Appropriate devices must be provided to detect an increase in temperature of the motor beyond design limits and automatically deenergize the equipment or provide an adequate alarm. Auxiliary equipment must be approved for the location in which it is installed.

[Recodified as § 296-307-37218. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37218, filed 10/31/96, effective 12/1/96.]

WAC 296-307-374 Special systems.

[Recodified as § 296-307-374. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-374, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37403 What requirements apply to systems over 600 volts, nominal? (1) Wiring methods for fixed installations over 600 volts, nominal, must meet the following requirements:

(a) Above-ground conductors must be installed in rigid metal conduit, in intermediate metal conduit, in cable trays, in cablebus, in other suitable raceways, or as open runs of metal-clad cable suitable for the use and purpose. Open runs of nonmetallic-sheathed cable or of bare conductors or bus-bars must be installed in locations accessible only to qualified persons. Metallic shielding components, such as tapes, wires, or braids for conductors, must be grounded. Open runs of insulated wires and cables with a bare lead sheath or a braided outer covering must be supported to prevent physical damage to the braid or sheath.

(b) Conductors emerging from the ground must be enclosed in approved raceways.

(2) Interrupting and isolating devices must meet the following requirements:

(a) Circuit breaker installations located indoors must consist of metal-enclosed units or fire-resistant cell-mounted units. Circuit breakers must be open mounted only in locations that are accessible only to qualified persons. A means of indicating the open and closed position of circuit breakers must be provided.

(b) Fused cutouts installed in buildings or transformer vaults must be approved for the purpose. They must be readily accessible for fuse replacement.

(c) A means must be provided to completely isolate equipment for inspection and repairs. Isolating means that are not designed to interrupt the load current of the circuit must be either interlocked with an approved circuit interrupter or provided with a sign warning against opening them under load.

(3) Mobile and portable equipment must meet the following requirements:

(a) A metallic enclosure must be provided on the mobile machine for enclosing the terminals of the power cable. The enclosure must include provisions for a solid connection for the ground wire terminal to effectively ground the machine frame. The method of cable termination used must prevent any strain or pull on the cable from stressing the electrical connections. The enclosure must be lockable so only autho-

ized qualified persons may open it and must be marked with a sign warning of the presence of energized parts.

(b) All energized switching and control parts must be enclosed in grounded metal cabinets or enclosures. Circuit breakers and protective equipment must have the operating means projecting through the metal cabinet or enclosure so these units can be reset without opening locked doors. Enclosures and metal cabinets must be locked so that only authorized qualified persons have access and must be marked with a sign warning of the presence of energized parts. Collector ring assemblies on revolving machines (shovels, draglines, etc.,) must be guarded.

(4) Tunnel installations of high-voltage power distribution and utilization equipment that is portable or mobile, such as substations, trailers, cars, mobile shovels, draglines, hoists, drills, dredges, compressors, pumps, conveyors, and underground excavators must meet the following requirements:

(a) Conductors in tunnels must be installed in one or more of the following:

(i) Metal conduit or other metal raceway;

(ii) Type MC cable; or

(iii) Other approved multiconductor cable.

Conductors must also be located or guarded to protect them from physical damage. Multiconductor portable cable may supply mobile equipment. An equipment grounding conductor must be run with circuit conductors inside the metal raceway or inside the multiconductor cable jacket. The equipment grounding conductor may be insulated or bare.

(b) Bare terminals of transformers, switches, motor controllers, and other equipment must be enclosed to prevent accidental contact with energized parts. Enclosures used in tunnels must be drip-proof, weatherproof, or submersible as required by environmental conditions.

(c) A disconnecting means that simultaneously opens all ungrounded conductors must be installed at each transformer or motor location.

(d) All nonenergized metal parts of electric equipment and metal raceways and cable sheaths must be effectively grounded and bonded to all metal pipes and rails at the portal and at maximum intervals of 1000 feet throughout the tunnel.

[Recodified as § 296-307-37403. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37403, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37406 What requirements apply to emergency power systems? This section applies to circuits, systems, and equipment intended to supply power for illumination and special loads, in the event of failure of the normal supply.

(1) Emergency circuit wiring must be kept entirely independent of all other wiring and equipment and must not enter the same raceway, cable, box, or cabinet as other wiring.

Exception: This does not apply where common circuit elements suitable for the purpose are required, or for transferring power from the normal to the emergency source.

(2) Where emergency lighting is necessary, the system must be arranged so that the failure of any individual lighting element, such as a burned out light bulb, cannot leave any space in total darkness.

[Recodified as § 296-307-37406, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37406, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37409 How are Class 1, Class 2, and Class 3 remote control, signaling, and power-limited circuits classified? (1) Class 1, Class 2, or Class 3 remote control, signaling, or power-limited circuits are characterized by their usage and electrical power limitation which differentiates them from light and power circuits. These circuits are classified according to their voltage and power limitations as follows.

(a) Class 1 circuits.

(i) A Class 1 power-limited circuit is supplied from a source with a maximum rated output of 30 volts and 1000 volt-amperes.

(ii) A Class 1 remote control circuit or a Class 1 signaling circuit has a maximum voltage of 600 volts; however, the power output of the source need not be limited.

(b) Class 2 and Class 3 circuits.

(i) Power for Class 2 and Class 3 circuits is limited either inherently (in which no overcurrent protection is required) or by a combination of a power source and overcurrent protection.

(ii) The maximum circuit voltage is 150 volts AC or DC for a Class 2 inherently limited power source, and 100 volts AC or DC for a Class 3 inherently limited power source.

(iii) The maximum circuit voltage is 30 volts AC and 60 volts DC for a Class 2 power source limited by overcurrent protection, and 150 volts AC or DC for a Class 3 power source limited by overcurrent protection.

(c) The maximum circuit voltages in (a) and (b) of this subsection apply to sinusoidal AC or continuous DC power sources, and where wet contact is unlikely.

(2) A Class 2 or Class 3 power supply unit must be durably and visibly marked to indicate the class of supply and its electrical rating.

[Recodified as § 296-307-37409, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37409, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37412 What requirements apply to fire protective signaling systems? (1) Fire protective signaling circuits must be classified either as nonpower limited or power limited.

(2) The power sources for use with fire protective signaling circuits must be either power limited or nonlimited as follows:

(a) The power supply of nonpower-limited fire protective signaling circuits must have a maximum output voltage of 600 volts.

(b) The power for power-limited fire protective signaling circuits must be either inherently limited, in which no overcurrent protection is required, or limited by a combination of power source and overcurrent protection.

(3) Nonpower-limited fire protective signaling circuits and Class 1 circuits may occupy the same enclosure, cable, or raceway if all conductors are insulated for maximum voltage of any conductor within the enclosure, cable or raceway. Power supply and fire protective signaling circuit conductors

are permitted in the same enclosure, cable, or raceway only if connected to the same equipment.

(4) Where open conductors are installed, power-limited fire protective signaling circuits must be separated at least 2 inches from conductors of any light, power, Class 1, and non-power-limited fire protective signaling circuits unless using a special and equally protective method of conductor separation. Cables and conductors of two or more power-limited fire protective signaling circuits or Class 3 circuits are permitted in the same cable, enclosure, or raceway. Conductors of one or more Class 2 circuits are permitted within the same cable, enclosure, or raceway with conductors of power-limited fire protective signaling circuits if the insulation of Class 2 circuit conductors in the cable, enclosure, or raceway is at least that needed for the power-limited fire protective signaling circuits.

(5) Fire protective signaling circuits must be identified at terminal and junction locations in a manner that will prevent unintentional interference with the signaling circuit during testing and servicing. Power-limited fire protective signaling circuits must be visibly and durably marked at terminations.

[Recodified as § 296-307-37412, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37412, filed 10/31/96, effective 12/1/96.]

WAC 296-307-376 Working on or near exposed energized parts.

[Recodified as § 296-307-376, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-376, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37603 What does this section cover? WAC 296-307-376 applies to work performed on exposed live parts (involving either direct contact or contact by means of tools or materials) or near enough to them for employees to be exposed to any hazard they present.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-37603, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-37603, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37603, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37606 Who may work on energized parts? Only qualified persons may work on electric circuit parts of equipment that have not been deenergized under the procedures of WAC 296-307-37807. Qualified persons must be capable of working safely on energized circuits and must be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-37606, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-37606, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37606, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37609 What requirements apply to working near low voltage lines? When employees are working near energized electrical service conductors operating at 750 volts or less, employees must work in a manner to prevent contact with the energized conductors.

[Recodified as § 296-307-37609. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37609, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37612 What requirements apply to qualified persons working near overhead lines? When a qualified person is working near overhead lines, whether in an elevated position or on the ground, the person must not approach, or take any conductive object without an approved insulating handle, closer to exposed energized parts than shown in WAC 296-307-150 unless:

(1) The person is insulated from the energized part (gloves, with sleeves if necessary, rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed); or

(2) The energized part is insulated both from all other conductive objects at a different potential and from the person; or

(3) The person is insulated from all conductive objects at a potential different from that of the energized part.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-37612, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-37612. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37612, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37615 What requirements apply to vehicles and mechanical equipment near overhead lines?

(1) Any vehicle or mechanical equipment that may have parts of its structure elevated near energized overhead lines must be operated so that a clearance of 10 ft. is maintained. If the voltage is higher than 50kV, the clearance must be increased 0.4 inch for every 1kV over the voltage. The clearance may be reduced only if:

(a) The vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. If the voltage is higher than 50kV, the clearance must be increased 0.4 inch for every 1kV over that voltage.

(b) Insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

(2) If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in WAC 296-307-150.

(3) Employees standing on the ground must not contact the vehicle or mechanical equipment or any of its attachments, unless:

(a) The employee is using protective equipment rated for the voltage; or

(b) The equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted in this section.

(4) If any vehicle or mechanical equipment that may have parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding must not stand at the

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grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, must be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-37615, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-37615. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37615, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37618 What lighting must be provided for employees working near exposed energized parts?

(1) Employees must not enter spaces containing exposed energized parts, unless lighting is provided that enables the employees to perform the work safely.

(2) Where lack of lighting or an obstruction prevents an employee from seeing the work to be performed, employees must not perform tasks near exposed energized parts. Employees shall not reach blindly into areas that may contain energized parts.

[Recodified as § 296-307-37618. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37618, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37621 What requirements apply to working near exposed energized parts in confined spaces?

(1) For working in a confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, the employer shall provide, and the employee must use, protective shields, protective barriers, or insulating materials that are necessary to avoid contact with these parts. Doors, hinged panels, and the like must be secured to prevent swinging into an employee and causing the employee to contact exposed energized parts.

(2) Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee handles long conductive objects (such as ducts and pipes) in areas with exposed live parts, you must institute work practices (such as the use of insulation, guarding, and material handling techniques) that will minimize the hazard.

(3) Portable ladders must have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized parts.

(4) Conductive articles of jewelry and clothing shall not be worn if they might contact exposed energized parts.

[Recodified as § 296-307-37621. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37621, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37624 What housekeeping requirements apply to working near exposed energized parts?

(1) Where live parts present an electrical contact hazard, employees must not perform housekeeping duties near enough to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided.

(2) Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and sil-

icon carbide, as well as conductive liquid solutions) must not be used in proximity to energized parts unless procedures are followed that will prevent electrical contact.

[Recodified as § 296-307-37624, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37624, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37627 Who may defeat an electrical safety interlock? Only a qualified person following the requirements of this section may defeat an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system must be returned to its operable condition when this work is completed.

[Recodified as § 296-307-37627, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37627, filed 10/31/96, effective 12/1/96.]

WAC 296-307-378 Safety-related work practices.

[Recodified as § 296-307-378, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-378, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37801 What does this section cover?

(1) WAC 296-307-376 and 296-307-378 cover electrical safety-related work practices for both qualified persons (those who have training in avoiding the electrical hazards of working on or near exposed energized parts) and unqualified persons (those with little or no such training) working on, near, or with the following installations:

(a) Installations of electric conductors and equipment within or on buildings or other structures, and on other premises such as yards, parking, and other lots, and industrial substations;

(b) Installations of conductors that connect to the supply of electricity;

(c) Installations of other outside conductors on the premises; and

(d) Installations of optical fiber cable where such installations are made along with electric conductors.

(2) WAC 296-307-367 and 296-307-378 cover work performed by unqualified persons on, near, or with the installations listed in subsection (3) of this section.

(3) WAC 296-307-376 and 296-307-378 do not apply to work performed by qualified persons on or directly associated with the following installations:

(a) Installations for the generation, control, transformation, transmission, and distribution of electric energy (including communication and metering) located in buildings used for such purposes or located outdoors.

Work on or directly associated with generation, transmission, or distribution installations includes:

(i) Work performed directly on installations, such as repairing distribution lines or repairing a feed-water pump for the boiler in a generating plant.

(ii) Work directly associated with installations, such as line-clearance tree trimming and replacing utility poles.

(iii) Work on electric utilization circuits in a generating plant where:

- The circuits are combined with installations of power generation equipment or circuits; and

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- The generation equipment or circuits present greater electrical hazards than those posed by the utilization equipment or circuits (such as exposure to higher voltages or lack of overcurrent protection).

(b) Installations in watercraft, railway rolling stock, aircraft, or automotive vehicles other than mobile homes and recreational vehicles.

(c) Installations of railways for generation, transformation, transmission, or distribution of power used exclusively for operation of rolling stock or installations of railways used exclusively for signaling and communication purposes.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-37801, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-37801, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37801, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37803 How must employees be trained on safety practices?

(1) The training requirements in this section apply to employees who face a risk of electrical shock that is not reduced to a safe level by the electrical installation requirements of WAC 296-307-362 through 296-307-374.

(2) Training contents must include the following:

(a) Employees must be trained in and familiar with the safety-related work practices required by WAC 296-307-376 through 296-307-378 that apply to their job assignments.

(b) Employees who are covered by this section but who are not qualified persons must also be trained in and familiar with any electrically related safety practices that are not covered by this standard, but that are necessary for their safety.

(c) Qualified persons must, at a minimum, be trained in and familiar with the following:

(i) The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment;

(ii) The skills and techniques necessary to determine the nominal voltage of exposed live parts; and

(iii) The clearance distance specified in WAC 296-307-376 and the corresponding voltages to which the qualified person will be exposed.

Note 1: For the purposes of WAC 296-307-376 and 296-307-378, an employee must have the training required for a qualified person in order to be considered a qualified person.

Note 2: Qualified persons whose work on energized equipment involves either direct contact or contact by means of tools or materials must also have the training needed to meet WAC 296-307-376.

(3) You must provide either classroom or on-the-job training. The degree of training provided must be determined by the risk to the employee.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-37803, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-37803, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37803, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37805 How must safety-related work practices be chosen and used? Safety-related work practices must be used to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts, when work is performed near or on equipment or circuits that are or may be energized. The specific safety-related work practices must be consistent with the nature and extent of the associated electrical hazards.

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(1) When an employee may be exposed to live parts, they must be deenergized before the employee works on or near them, unless deenergizing introduces other hazards or is infeasible due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground need not be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

- Note 1: Examples of other hazards include deactivation of emergency alarm systems, shutdown of hazardous location ventilation equipment, or removal of illumination for an area.
- Note 2: An example of work that may be performed on or near energized circuit parts because of unfeasibility due to equipment design or operational limitations is testing of electric circuits that can only be performed with the circuit energized.

(2) If the exposed live parts are not deenergized (for reasons of increased or additional hazards or unfeasibility), other safety-related work practices must be used to protect employees who may be exposed to the electrical hazards involved. Such work practices must protect employees against contact with energized circuit parts directly with any part of their body or indirectly through some other conductive object. The work practices must be suitable for the voltage level of the exposed electric conductors or circuit parts.

[Recodified as § 296-307-37805, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37805, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37807 What work practices must be followed for work on exposed deenergized parts? (1) This section applies to work on exposed deenergized parts or near enough to them to expose the employee to any electrical hazard they present. Conductors and parts of electric equipment that have been deenergized but have not been locked out or tagged must be treated as energized parts, and WAC 296-307-376 applies to work on or near them.

(2) While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been deenergized, the circuits energizing the parts must be locked out or tagged or both according to the requirements of this section. The requirements must be followed in the order in which they are presented.

"Fixed equipment" means equipment that is fastened or connected by permanent wiring methods.

- Note: Lockout and tagging procedures that comply with WAC 296-307-320 will also be deemed to comply with WAC 296-307-37807 through 296-307-37817 if:
- The procedures address the electrical safety hazards covered by this part; and
 - The procedures include the requirements of WAC 296-307-37813(4) and 296-307-37815(2).

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-37807, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-37807, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37807, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37809 Must an employer have a written copy of lockout-tagout procedures? The employer must maintain a written copy of the procedures outlined in WAC 296-307-37807 through 296-307-37817 and must make it available for inspection by us or by employees. The written procedures may be in the form of a copy of WAC 296-307-37807 through 296-307-37817.

[Title 296 WAC—p. 2594]

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-37809, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-37809, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37809, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37811 What work practices must be followed for deenergizing equipment? (1) Safe procedures for deenergizing circuits and equipment must be determined before circuits or equipment are deenergized.

(2) The circuits and equipment to be worked on must be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches, and interlocks, must not be used as the sole means for deenergizing circuits or equipment. Interlocks for electric equipment must not be used as a substitute for lockout and tagging procedures.

(3) Stored electric energy which might endanger employees must be released. Capacitors must be discharged and high capacitance elements must be short-circuited and grounded, if the stored electric energy might endanger employees.

- Note: Capacitors or associated equipment handled in meeting this requirement must be treated as energized.

(4) Stored nonelectrical energy in devices that could reenergize electric circuit parts must be blocked or relieved to the extent that the circuit parts could not be accidentally energized by the device.

[Recodified as § 296-307-37811, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37811, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37813 How must locks and tags be applied? (1) A lock and a tag must be placed on each disconnecting means used to deenergize circuits and equipment on which work is to be performed, except as provided in subsections (3) and (5) of this section. The lock must be attached to prevent anyone from operating the disconnecting means unless they resort to undue force or the use of tools.

(2) Each tag must have a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.

(3) If a lock cannot be applied, or if tagging procedures will provide a level of safety equivalent to that obtained by the use of a lock, a tag may be used without a lock.

(4) A tag used without a lock must be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by the use of a lock. Examples of additional safety measures include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.

(5) A lock may be placed without a tag only under the following conditions:

(a) Only one circuit or piece of equipment is deenergized; and

(b) The lockout period does not extend beyond the work shifts; and

(c) Employees exposed to the hazards associated with reenergizing the circuit or equipment are familiar with this procedure.

[Recodified as § 296-307-37813, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37813, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37815 What work practices must be followed to verify deenergization? The requirements of this section must be met before any circuits or equipment can be considered and worked as deenergized.

(1) A qualified person must operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.

(2) A qualified person must use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are deenergized. The test must also determine if any energized conditions exist as a result of inadvertently induced voltage or unrelated voltage backfeed even though specific parts of the circuit have been deenergized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment must be checked for proper operation immediately before and immediately after this test.

[Recodified as § 296-307-37815, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37815, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37817 What work practices must be followed when reenergizing equipment? These requirements must be met, in the order given, before circuits or equipment are reenergized, even temporarily.

(1) A qualified person must conduct tests and visual inspections as necessary to verify that all tools, electrical jumpers, shorts, grounds, and other devices have been removed, so that the circuits and equipment can be safely energized.

(2) Employees exposed to the hazards associated with reenergizing the circuit or equipment must be warned to stay clear of circuits and equipment.

(3) Each lock and tag must be removed by the employee who applied it or under his or her direct supervision. However, if this employee is absent from the workplace, then the lock or tag must be removed by a qualified person designated to perform this task if:

(a) The employer ensures that the employee who applied the lock or tag is not available at the workplace; and

(b) The employer ensures that the employee is aware that the lock or tag has been removed before resuming work at that workplace.

(4) There shall be a visual determination that all employees are clear of the circuits and equipment.

[Recodified as § 296-307-37817, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37817, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37819 What safety-related work practices relate to portable electric equipment? This section applies to using cord-connected and plug-connected equipment, including flexible cord sets (extension cords).

(1) Portable equipment must be handled in a manner that will not cause damage. Flexible electric cords connected to equipment must not be used for raising or lowering the equipment. Flexible cords must not be fastened with staples or oth-

erwise hung in a way that could damage the outer jacket or insulation.

(2) Visual inspection requirements:

(a) Portable cord-connected and plug-connected equipment and flexible cord sets must be visually inspected before use on any shift for external defects (such as loose parts, deformed and missing pins, or damage to outer jackets or insulation) and for evidence of possible internal damage (such as pinched or crushed outer jacket). Cord-connected and plug-connected equipment and flexible cord sets that remain connected once they are in place and are not exposed to damage need not be visually inspected until they are relocated.

(b) If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged items must be removed from service, and no employee shall use it until repairs and tests necessary to render the equipment safe have been made.

(c) When an attachment plug is to be connected to a receptacle (including any on a cord set), the relationship of the plug and receptacle contacts must first be checked to ensure they are of proper mating configurations.

(3) Requirements for grounding-type equipment:

(a) A flexible cord used with grounding-type equipment must contain an equipment grounding conductor.

(b) Attachment plugs and receptacles must not be connected or altered in a manner that would prevent proper continuity of the equipment grounding conductor at the point where plugs are attached to receptacles. These devices must not be altered to allow the grounding pole of a plug to be inserted into slots intended for connection to the current-carrying conductors.

(c) Adapters that interrupt the continuity of the equipment grounding connection are prohibited.

(4) Portable electric equipment and flexible cords used in highly conductive work locations, or in locations where employees are likely to contact water or conductive liquids, must be approved for those locations.

(5) Connecting attachment plugs.

(a) Employees' hands must not be wet when plugging and unplugging flexible cords and cord-connected and plug-connected equipment, if energized equipment is involved.

(b) Energized plug and receptacle connections must be handled only with insulating protective equipment if the condition of the connection could provide a conducting path to the employee's hand. For example: If a cord connector is wet from being immersed in water.

(c) Locking-type connectors must be properly secured after connection.

[Recodified as § 296-307-37819, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37819, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37821 What safety-related work practices relate to electric power and lighting circuits? (1) Load rated switches, circuit breakers, or other devices specifically designed as disconnecting means must be used for the opening, reversing, or closing of circuits under load conditions. Any cable connectors other than the load-break type, fuses, terminal lugs, and cable splice connections are prohibited for such purposes, except in an emergency.

(2) After a circuit is deenergized by a circuit protective device, the circuit must not be manually reenergized until it has been determined that the equipment and circuit can be safely energized. This repetitive manual reclosing of circuit breakers or reenergizing circuits through replaced fuses is prohibited.

Note: When it can be determined from the design of the circuit and the overcurrent devices involved that the automatic operation of a device was caused by an overload rather than a fault connection, no examination of the circuit or connected equipment is needed before the circuit is reenergized.

(3) Overcurrent protection of circuits and conductors must not be modified, even on a temporary basis, beyond that allowed by this part for the installation safety requirements for overcurrent protection.

[Recodified as § 296-307-37821. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37821, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37823 What safety-related work practices relate to test instruments and equipment? (1) Only qualified persons may perform testing work on electric circuits or equipment.

(2) Test instruments and equipment and all associated test leads, cables, power cords, probes, and connectors must be visually inspected for external defects and damage before the equipment is used. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item must be removed from service, and no employee may use it until necessary repairs and tests to render the equipment safe have been made.

(3) Test instruments and equipment and their accessories must be rated for the circuits and equipment to which they will be connected and must be designed for the environment in which they will be used.

[Recodified as § 296-307-37823. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37823, filed 10/31/96, effective 12/1/96.]

WAC 296-307-37825 What safety-related work practices relate to flammable materials? Where flammable materials are present only occasionally, electric equipment capable of igniting them must not be used, unless measures are taken to prevent hazardous conditions from developing.

Such materials include, but are not limited to: Flammable gases, vapors, or liquids; combustible dust; and ignitable fibers or flyings.

Note: Electrical installation requirements for locations where flammable materials are present on a regular basis are contained in WAC 296-307-372.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-37825, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-37825. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-37825, filed 10/31/96, effective 12/1/96.]

WAC 296-307-380 Electrical protective equipment.

[Recodified as § 296-307-380. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-380, filed 10/31/96, effective 12/1/96.]

[Title 296 WAC—p. 2596]

WAC 296-307-38003 How must protective equipment be used? (1) Employees working in the areas where there are potential electrical hazards must have and use electrical protective equipment that is appropriate for the specific parts of the body to be protected and for the work to be performed.

(2) If the insulating capability of protective equipment may be subject to damage during use, the insulating material must be protected.

For example: An outer covering of leather is sometimes used to protect rubber insulating material.

(3) Employees must wear nonconductive head protection wherever there is a danger of head injury from electric shock or burns due to contact with exposed energized parts.

(4) Employees must wear protective equipment for the eyes or face wherever there is danger of injury to the eyes or face from electrical arcs or flashes or from flying objects resulting from electrical explosion.

[Recodified as § 296-307-38003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-38003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-38006 What requirements apply to general protective equipment and tools? (1) When working near exposed energized conductors or circuit parts, each employee must use insulated tools or handling equipment if the tools or handling equipment might make contact with such conductors or parts. If the insulating capability of insulated tools or handling equipment is subject to damage, the insulating material must be protected.

(2) Ropes and handlines used near exposed energized parts must be nonconductive.

(3) Protective shields, protective barriers, or insulating materials must be used to protect each employee from shock, burns, or other electrically related injuries while that employee is working near exposed energized parts that might be accidentally contacted or where dangerous electric heating or arcing might occur. When normally enclosed live parts are exposed for maintenance or repair, they must be guarded to protect unqualified persons from contact with the live parts.

(4) Altering techniques must be used to warn and protect employees from hazards that could cause injury due to electric shock, burns, or failure of electric equipment parts.

(5) Safety signs, safety symbols, or accident prevention tags must be used where necessary to warn employees about electrical hazards that may endanger them, as required by WAC 296-307-330.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-38006, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-38006. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-38006, filed 10/31/96, effective 12/1/96.]

WAC 296-307-38009 What manufacturing and marking requirements apply to electrical protective devices? Insulating blankets, matting, covers, line hose, gloves, and sleeves made of rubber must meet the following manufacture and marking requirements:

(1) Blankets, gloves, and sleeves must be produced by a seamless process.

(2) Each item must be clearly marked as follows:

(a) All classified equipment must be marked with its class number.

(b) Nonozone-resistant equipment other than matting must be marked Type I.

(c) Ozone-resistant equipment other than matting must be marked Type II.

(d) Other relevant markings, such as the manufacturer's identification and the size of the equipment, may also be provided.

(3) Markings must be nonconducting and shall be applied so they do not impair the insulating qualities of the equipment.

(4) Markings on gloves must be on the cuff.

[Recodified as § 296-307-38009, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-38009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-38012 What electrical requirements apply to electrical protective devices? Insulating blankets, matting, covers, line hose, gloves, and sleeves made of rubber must meet the following electrical requirements:

(1) Equipment must be capable of withstanding the a-c proof-test voltage specified in Table 1 or the d-c proof-test voltage specified in Table 2.

(a) The proof-test must reliably indicate that the equipment can withstand the voltage involved.

(b) The test voltage must be applied continuously for three minutes for equipment other than matting and must be applied continuously for one minute for matting.

(c) Gloves must also be capable of withstanding the a-c proof-test voltage specified in Table 1 after a sixteen-hour water soak.

(2) When the a-c proof-test is used on gloves, the 60 hertz proof-test current must not exceed the values specified in Table 1 at any time during the test period.

(a) If the a-c proof-test is made at a frequency other than 60 hertz, the permissible proof-test current must be computed from the direct ratio of the frequencies.

(b) For the test, gloves (right side out) must be filled with tap water and immersed in water to a depth that is in accordance with Table 3. Water must be added to or removed from the glove, as necessary, so that the water level is the same inside and outside the glove.

(c) After the sixteen-hour water soak, the 60 hertz proof-test current may exceed the values given in Table 1 by not more than 2 milliamperes.

(3) Equipment that has been subjected to a minimum breakdown voltage test must not be used for electrical protection.

(4) Material used for Type II insulating equipment must be capable of withstanding an ozone test, with no visible effects. The ozone test must reliably indicate that the material will resist ozone exposure in actual use. Any visible signs of ozone deterioration of the material, such as checking, cracking, breaks, or pitting, is evidence of failure to meet the requirements for ozone-resistant material.

Note: Rubber insulating equipment meeting the following national consensus standards is considered to be in compliance with WAC 296-307-38009, 296-307-38012, and 296-307-38015:

- American Society for Testing and Materials (ASTM) D 120-87, Specification for Rubber Insulating Gloves.

- ASTM D 178-93, Specification for Rubber Insulating Matting.
- ASTM D 1048-93, Specification for Rubber Insulating Blankets.
- ASTM D 1049-93, Specification for Rubber Insulating Covers.
- ASTM D 1050-90, Specification for Rubber Insulating Line Hose.
- ASTM D 1051-87, Specification for Rubber Insulating Sleeves.

These standards contain specifications for conducting the tests required in this section.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-38012, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-38012, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-38012, filed 10/31/96, effective 12/1/96.]

WAC 296-307-38015 What workmanship and finish requirements apply to electrical protective devices? Insulating blankets, matting, covers, line hose, gloves, and sleeves made of rubber must meet the following workmanship and finish requirements:

(1) Equipment must be free of harmful physical irregularities that can be detected by the tests or inspections required in WAC 296-307-38012.

(2) Surface irregularities that may be present on all rubber goods because of imperfections on forms or molds or because of inherent difficulties in the manufacturing process and that may appear as indentations, protuberances, or imbedded foreign material are acceptable if:

(a) The indentation or protuberance blends into a smooth slope when the material is stretched.

(b) Foreign material remains in place when the insulating material is folded and stretches with the insulating material surrounding it.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-38015, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-38015, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-38015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-38018 How must electrical protective devices be maintained and used? (1) Electrical protective equipment must be maintained in a safe, reliable condition.

(2) The following specific requirements apply to insulating blankets, covers, line hose, gloves, and sleeves made of rubber:

(a) Maximum use voltages must meet the requirements in Table 4.

(b) Insulating equipment must be inspected for damage before each day's use and immediately following any incident that can reasonably be suspected of having caused damage. Insulating gloves must be given an air test, along with the inspection.

(c) Insulating equipment with any of the following defects must not be used:

(i) A hole, tear, puncture, or cut;

(ii) Ozone cutting or ozone checking (the cutting action produced by ozone on rubber under mechanical stress into a series of interlacing cracks);

(iii) An embedded foreign object;

(iv) Any of the following texture changes: Swelling, softening, hardening, or becoming sticky or inelastic;

(v) Any other defect that damages the insulating properties.

(d) Insulating equipment found to have other defects that might affect its insulating properties must be removed from service and returned for testing under (h) of this subsection.

(e) Insulating equipment must be cleaned as needed to remove foreign substances.

(f) Insulating equipment must be stored in such a location and in such a manner as to protect it from light, temperature extremes, excessive humidity, ozone, and other injurious substances and conditions.

(g) Protector gloves must be worn over insulating gloves.

(h) Electrical protective equipment must be subjected to periodic electrical tests. Test voltages and the maximum intervals between tests must be according to Table 4 and Table 5.

(i) The test method used must reliably indicate whether the insulating equipment can withstand the voltages involved.

Note: Standard electrical test methods considered as meeting this requirement are given in the following national consensus standards:

- American Society for Testing and Materials (ASTM) D 120-87, Specification for Rubber Insulating Gloves.
- ASTM D 1048-93, Specification for Rubber Insulating Blankets.
- ASTM D 1049-93, Specification for Rubber Insulating Covers.
- ASTM D 1050-90, Specification for Rubber Insulating Line Hose.

- ASTM D 1051-87, Specification for Rubber Insulating Sleeves.
- ASTM F 478-92, Specification for In-Service Care of Insulating Line Hose and Covers.
- ASTM F 479-88a, Specification for In-Service Care of Insulating Blankets.
- ASTM F 496-93b, Specification for In-Service Care of Insulating Gloves and Sleeves.

(j) Insulating equipment that fails inspections or electrical tests must not be used by employees, except as follows:

(i) Rubber insulating line hose could be used in shorter lengths with the defective portion cut off.

(ii) Rubber insulating blankets could be repaired using a compatible patch that results in physical and electrical properties equal to those of the blanket.

(iii) Rubber insulating blankets could be salvaged by severing the defective area from the undamaged portion of the blanket. The resulting undamaged area must not be smaller than twenty-two inches by twenty-two inches (560 mm by 560 mm) for Class 1, 2, 3, and 4 blankets.

(k) Repaired insulating equipment must be retested before it may be used by employees.

(l) You must certify that equipment has been tested in accordance with the requirements of (h), (i), and (k) of this subsection. The certification must identify the equipment that passed the test and the date it was tested.

Note: This requirement may be met by marking the equipment and entering the results of the tests and the dates of testing onto logs.

Class of equipment	Proof-test voltage rms V	267 mm (10.5 in.) glove	356 mm (14 in.) glove	406 mm (16 in.) glove	457 mm (18 in.) glove
0	5,000	8	12	14	16
1	10,000		14	16	18
2	20,000		16	18	20
3	30,000		18	20	22
4	40,000			22	24

Class of equipment	Proof-test voltage
0	20,000
1	40,000
2	50,000
3	60,000
4	70,000

Note: The d-c voltages listed in this table are not appropriate for proof testing rubber insulating line hose or covers. For this equipment, d-c proof-tests shall use a voltage high enough to indicate that the equipment can be safely used at the voltages listed in Table 3. See ASTM D 1050-90 and ASTM D 1049-88 for further information on proof tests for rubber insulating line hose and covers.

Table 3 Glove Tests-Water Level ^{1, 2}				
Class of glove	A-C proof-test		D-C proof-test	
	mm.	in.	mm.	in.
0	38	1.5	38	1.5
1	38	1.5	51	2.0
2	64	2.5	76	3.0
3	89	3.5	102	4.0
4	127	5.0	153	6.0

¹The water level is given as the clearance from the cuff of the glove to the water line, with a tolerance of 13 mm. (0.5 in.).
²If atmospheric conditions make the specified clearances impractical, the clearances may be increased by a maximum of 25 mm. (1 in.)

Table 4 Rubber Insulating Equipment Voltage Requirements			
Class of equipment	Maximum use voltage ¹ a-c-rms	Retest voltage ² a-c-rms	Retest voltage ² d-c-rms
0	1,000	5,000	20,000
1	7,500	10,000	40,000
2	17,000	20,000	50,000
3	26,500	30,000	60,000
4	36,000	40,000	70,000

Note: Rubber gloves shall only be used on voltages of 5000 volts phase to phase or less.
¹The maximum use voltage is the a-c voltage (rms) classification of the protective equipment that designates the maximum nominal design/voltage of the energized system that may be safely worked. The nominal design voltage is equal to the phase-to-phase voltage on multiphase circuits. However, the phase-to-ground potential is considered to be the nominal design/voltage:
 (a) If there is no multiphase exposure in a system area and if the voltage exposure is limited to the phase-to-ground potential, or
 (b) If the electrical equipment and devices are insulated or isolated or both so that the multiphase exposure on a grounded wye circuit is removed.
²The proof-test voltage shall be applied continuously for at least one minute, but no more than three minutes.

Table 5 Rubber Insulating Equipment Test Intervals	
Type of equipment	When to test
Rubber insulating line hose	Upon indication that insulating value is suspect
Rubber insulating covers	Upon indication that insulating value is suspect
Rubber insulating blankets	Before first issue and every 12 months thereafter
Rubber insulating gloves	Before first issue and every 6 months thereafter
Rubber insulating sleeves	Before first issue and every 12 months thereafter

(3) Where switches or fuses of more than 150 volts to ground are not guarded during ordinary operations, suitable insulating floors, mats or platforms must be provided on which the operator must stand while handling the switches.

[Recodified as § 296-307-38018. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-38018, filed 10/31/96, effective 12/1/96.]

SPECIALIZED OPERATIONS

Part U-1

Hazardous Materials—Anhydrous Ammonia

WAC 296-307-400 Anhydrous ammonia.

[Recodified as § 296-307-400. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-400, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40001 What does this section cover?

WAC 296-307-400 covers the transportation and application of anhydrous ammonia.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-40001, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-40001. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40001, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40003 What definitions apply to this section? "Certified" means the equipment has been tested by a nationally recognized testing laboratory and meets nationally recognized standards or is safe for a specific use; or is a kind whose production is periodically inspected by a nationally recognized testing laboratory, and bears identification of certification.

"DOT" means the Federal Department of Transportation.

"DOT container" means a container constructed according to the requirements of 49 CFR chapter 1.

"DOT cylinder" means a cylinder that meets the requirements of 49 CFR chapter I.

"Labeled" means the equipment has an attached label, symbol, or other identifying mark of a nationally recognized testing laboratory that makes periodic inspections of the production of such equipment, and the label indicates compliance with nationally recognized standards or tests.

[Recodified as § 296-307-40003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40005 What general requirements apply to the storage and handling of anhydrous ammonia? (1) All employees must use at least gloves and goggles and may supplement with a face shield while working on or with charged anhydrous ammonia equipment.

(2) You must ensure that equipment is inspected before each day's work. Conditions that would contribute to leaks shall be corrected.

(3) Hose end-valves must be closed when not in use to prevent accidental discharge in case the main valve is opened.

(4) Relief and vapor valves must discharge away from the operator's working position.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-40005, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-40005. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40007 What requirements apply to systems mounted on farm wagons (implements of husbandry) for the transportation of ammonia? All anhy-

drous ammonia containers with a capacity of 3,000 gallons or less and equipment mounted on farm wagons (implements of husbandry) that is used to transport ammonia must meet the requirements of this section.

WAC 296-307-40011 through 296-307-40037 also apply unless otherwise noted.

(1) Containers must meet the following mounting requirements:

(a) The farm wagon or container has a stop so the container does not dislodge from its mounting when a farm wagon stops suddenly.

(b) The container is anchored to the farm wagon at one or more places on each side of the container.

(c) The weight of containers mounted on four-wheel farm wagons, is distributed evenly over both axles.

(d) When the cradle and the container are not welded together, material between them eliminates metal-to-metal friction.

(2) Container accessories must meet the following requirements:

(a) Each container has a fixed maximum liquid-level gauge.

(b) All containers with more than 250-gallon capacity have a pressure gauge with a dial graduated from 0-400 psi.

(c) The filling connection is fitted with one of the following:

(i) A combination back-pressure check valve and excess-flow valve; or

(ii) One double or two single back-pressure check valves; or

(iii) A positive shut-off valve that has either an internal back-pressure check valve or an internal excess flow valve.

(d) All containers with more than 250-gallon capacity are equipped for spray loading or with an approved vapor return valve.

(e) All vapor and liquid connections have approved excess flow valves or quick-closing internal valves that are only open for operating.

Exception: Safety-relief valves and connections that are specifically exempted by WAC 296-307-40019(5) are exempt from this requirement.

(f) Fittings are protected from physical damage by a rigid guard. The guard is designed to withstand force from any direction, equal to twice the weight of the container and lading, at a safety factor of four. If the guard is fully enclosed, the safety-relief valves are properly vented through the guard.

(g) If a liquid withdrawal line is installed in the bottom of a container, the connections and hose are at least as high as the lowest horizontal edge of the farm wagon axle.

(h) Both ends of the hose are secure while in transit.

(3) Each side and the rear end of the container must be marked in letters at least four inches high, with the words "ANHYDROUS AMMONIA" or, "CAUTION—AMMONIA," or marked according to DOT regulations.

(4) Farm wagons (implements of husbandry) must meet all state regulations and the following requirements:

(a) All farm wagons must be securely attached to the vehicle drawing them by drawbars with safety chains.

(b) A farm wagon must be constructed so that it will follow the path of the towing vehicle and will prevent the towed

wagon from whipping or swerving dangerously from side to side.

(c) All farm wagons must have five gallons or more of readily available clean water.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-40007, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-40007, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-40007, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40009 What requirements apply to systems mounted on farm wagons (implements of husbandry) for the application of ammonia? This section applies to systems mounted on farm equipment that are used for the field application of ammonia.

WAC 296-307-40011 through 296-307-40037 also apply unless otherwise noted.

(1) All containers must be securely mounted.

(2) Container valves and accessories must meet the following requirements:

(a) Each container has a fixed maximum liquid-level gauge.

(b) The filling connection is fitted with one of the following:

(i) A combination back-pressure check valve and excess-flow valve; or

(ii) One double or two single back-pressure check valves; or

(iii) A positive shut-off valve that has either an internal back-pressure check valve or an internal excess flow valve.

(c) An excess-flow valve is not required in the vapor connection if the controlling orifice is a maximum of 7/16 inch in diameter and the valve is a hand-operated shut-off valve. To assist in filling applicator tanks, you may bleed vapors to the open air, if this requirement is met.

(d) Metering devices may be connected directly to the tank withdrawal valve. You may use a union type connection between the tank valve and metering device. You may use remote mounting of metering devices if the hose meets the requirements of Appendix B. When the applicator tank is trailed and the metering device is remotely mounted, such as on the tractor tool bar, you must use an automatic break-away type, self-closing coupling.

(e) No excess-flow valve is required in the liquid withdrawal line if the controlling orifice between the contents of the container and the outlet of the shut-off valve is a maximum of 7/16 inch in diameter.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-40009, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-40009, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-40009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40011 What requirements must approved anhydrous ammonia equipment meet? All equipment must be approved by one of the following methods:

(1) The equipment was installed before February 8, 1973, and was approved and tested, and installed according to either the requirements of the American National Standard for the Storage and Handling of Anhydrous Ammonia, K61.1, or the Fertilizer Institute Standards for the Storage

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and Handling of Agricultural Anhydrous Ammonia, M-1, in effect at the time of installation; or

(2) The equipment is accepted, or certified, or listed, or labeled, or otherwise determined to be safe by a nationally recognized testing laboratory; or

(3)(a) The equipment is a type that no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe; and

(b) The equipment is inspected or tested by an authority responsible for enforcing occupational safety provisions of a law, code, or regulation pertaining to the storage, handling, transport, and use of anhydrous ammonia; and

(c) The equipment is found in compliance with either the requirements of the American National Standard for the Storage and Handling of Anhydrous Ammonia, K61.1, or the Fertilizer Institute Standards for the Storage and Handling of Agricultural Anhydrous Ammonia, M-1, in effect at the time of installation; or

(4) For a custom-designed and custom-built unit:

(a) You cannot find a nationally recognized testing laboratory or authority responsible for the enforcement of a law, code or regulation pertaining to the storage, transportation and use of anhydrous ammonia that is willing to accept, certify, list, label or determine to be safe your custom equipment; and

(b) You have on file a document attesting to its safe condition following appropriate tests. The document must be signed by a registered professional engineer or qualified person. The document must describe the test bases, test data and results, and also the qualifications of the certifying person.

[Recodified as § 296-307-40011, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-40011, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40013 What requirements apply to the construction, original test, and requalification of nonrefrigerated containers? The code is the Unfired Pressure Vessel Code of the American Society of Mechanical Engineers (Section VIII of the ASME Boiler Construction Code), 1952, 1956, 1959, 1962, 1965, 1968 and 1971 editions, the joint code of the American Petroleum Institute and the American Society of Mechanical Engineers (API-ASME Code) 1951 edition, and amendments or later editions, as adopted.

(1) Containers used with systems covered in WAC 296-307-40005 and 296-307-40007 must be constructed and tested according to the code.

Exception: Construction under Table UW-12 at a basic joint efficiency of under 80% is prohibited. Containers built according to code are exempt from paragraphs UG-125 to UG-128, inclusive, and paragraphs UG-132 and UG-133 of the code.

Note: This subsection allows the continued use or reinstallation of containers constructed and maintained according to the 1949, 1950, 1952, 1956, 1959, 1962, 1965 and 1968 editions of the Unfired Pressure Vessel Code of the ASME or any revisions thereof in effect at the time of fabrication.

(2) Containers more than 36 inches in diameter or 250 gallons water capacity must be constructed to meet one or more of the following requirements:

(a) Containers must be stress relieved after fabrication according to the code; or

(b) Cold-formed heads, when used, must be stress relieved; or

(c) Hot-formed heads must be used.

(3) Welding to the shell, head, or any other part of the container subject to internal pressure must be according to the code. Other welding is permitted only on saddle plates, lugs, or brackets attached to the container by the container manufacturer.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-40013, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-40013, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-40013, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40015 How must nonrefrigerated containers and systems (other than DOT containers) be marked? (1) System nameplates, when required, must be permanently attached to the system so they are readily accessible for inspection.

(2) Each container or system covered in WAC 296-307-40005 and 296-307-40007 must be marked as follows:

(a) With indication that the container or system meets the requirements of the code under which the container is constructed.

(b) With indication on the container and system nameplate when the system is designed for underground installation.

(c) With the name and address of the supplier of the container or the trade name of the container and with the date of fabrication.

(d) With the water capacity of the container in pounds at 60°F or gallons, United States standard.

(e) With the design pressure in pounds per square inch gauge.

(f) With the wall thickness of the shell and heads.

(g) With indication of the maximum fill level for liquid anhydrous ammonia between 20°F and 100°F. Markings must be in increments of not more than 20°F.

Exception: Containers with fixed maximum level indicators, such as fixed length dip tubes, or containers that are filled by weight are exempt from this requirement.

(h) With the outside surface area in square feet.

(i) With minimum temperature in Fahrenheit for which the container is designed.

(j) The marking must be on the container itself or on a permanently attached nameplate.

(3) All main operating valves on permanently installed containers with a capacity of over 3,000 water gallons must be identified to show whether the valve is in liquid or vapor service. The valve must be identified as follows:

(a) The word LIQUID (or LIQUID VALVE), VAPOR (or VAPOR VALVE), as appropriate, must be placed on or within twelve inches of the valve by means of a stencil tag or decal.

(b) Liquid valves must be painted orange and vapor valves must be painted yellow. The legend ORANGE-LIQUID, YELLOW-VAPOR must be displayed in one or more conspicuous places at each permanent storage location. The legend must have letters at least two inches high and must be placed against a contrasting background.

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[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-40015, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-40015, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-40015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40017 Where may anhydrous ammonia containers be located? (1) When selecting the location for a storage container, you must take into account the physiological effects of ammonia and adjacent fire hazards. Containers located indoors must be in areas especially approved for container storage.

(2) Containers must be located at least fifty feet from a dug well or other sources of potable water supply, unless the container is a part of a water treatment installation.

(3) Permanent storage containers must be located outside densely populated areas.

(4) Containers must be located according to the following:

Minimum distances (feet) from container to:

Nominal capacity of container	Line of adjoining property that may be built upon, highways & main line of railroad	Place of public assembly	Institution occupancy
Over 500 to 2,000	25	150	250
Over 2,000 to 30,000	50	300	500
Over 30,000 to 100,000	50	450	750
Over 100,000	50	600	1,000

(5) Storage areas must be kept free of readily ignitable materials such as waste, weeds and long dry grass.

[Recodified as § 296-307-40017, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-40017, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40019 What requirements apply to container accessories? (1) All accessories must be designed for at least the maximum working pressure of the part of the system on which they are installed. All accessories must be fabricated from materials suitable for anhydrous ammonia service.

(2) All connections to containers must have shut-off valves located as close to the container as practical.

Exception: Safety-relief devices, gauging devices, or those fitted with a No. 54 drill size orifice are exempt from this requirement.

(3) All required excess flow valves must close automatically at the rated flows of vapor or liquid specified by the manufacturer. The connections, lines, valves, and fittings must have a greater capacity than the rated flow of the excess flow valve.

(4) Liquid-level gauging devices that require bleeding to the atmosphere and that are constructed so that outward flow is a maximum of that passed by a No. 54 drill size opening may be installed without excess flow valves.

(5) Openings from the container or through fittings attached directly on container to which pressure gauge connections are made may be installed without excess flow valves if the openings are a maximum of No. 54 drill size.

(6) Required excess flow and back pressure check valves must be located inside the container or outside as close as practical to where the line enters the container. When located outside, the installation must be made to prevent any stress beyond the excess flow or back pressure check valve from causing a break between the container and the valve.

(7) Excess flow valves must be designed with a bypass that is a maximum of No. 60 drill size opening to allow equalization of pressures.

(8) Shut-off valves provided with an excess flow valve must be designed for proper installation in a container connection so that the excess flow valve will close if the shut-off valve breaks.

(9) All excess flow valves must be plainly and permanently marked with the name or trademark of the manufacturer, the catalog number, and the rated capacity.

[Recodified as § 296-307-40019, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40019, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40021 What requirements apply to piping, tubing, and fittings? (1) All piping, tubing and fittings must be made of material suitable for anhydrous ammonia service.

(2) All piping, tubing and fittings must be designed for a pressure of at least the maximum pressure to which they may be subjected in service.

(3) All piping must be well supported and allow for expansion and contraction. All refrigeration system piping must conform to the Refrigeration Piping Code (ANSI B31.5 1966 addenda B31.1a-1968), a section of the American Standard Code for Pressure Piping, as it applies to ammonia.

(4) Piping used on nonrefrigerated systems must meet the requirements of ASTM A-53-1969 Grade B Electric Resistance Welded and Electric Flash Welded Pipe. Pipe must be at least Schedule 40 when joints are welded, or welded and flanged. Pipe must be at least Schedule 80 when joints are threaded. Brass, copper, or galvanized steel pipe or tubing is prohibited.

(5) All metal flexible connections for permanent installations must have a minimum working pressure of 250 psig (safety factor of 4). For temporary installations, you may use hose that meets the requirements of WAC 296-307-40023.

(6) Cast iron fittings are prohibited. You must use fittings made especially for ammonia service of malleable or nodular iron that meet the requirements of Specification ASTM A47 or ASTM A395.

(7) All piping, tubing, and fittings must allow for expansion, contraction, jarring, vibration, and settling.

(8) You must make adequate provision to protect all exposed piping from physical damage from moving machinery, the presence of automobiles or trucks, or other strain on the piping.

(9) Joint compounds must be resistant to ammonia.

(10) After assembly, all piping and tubing must be tested and proved to be free from leaks at pressure that is at least equal to the normal operating pressure of the system.

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[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-40021, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-40021. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40021, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40023 What specifications must hoses meet? (1) Hose used in ammonia service and subject to container pressure must meet the requirements of the joint Rubber Manufacturers Association and the Fertilizer Institute "Hose Specifications for Anhydrous Ammonia."

(2) Hose subject to container pressure must be designed for a minimum working pressure of 350 psig and a minimum burst pressure of 1750 psig. Hose assemblies must be able to withstand a test pressure of 500 psig.

(3) Hose and hose connections on the low pressure side of flow control or pressure reducing valves on devices discharging to atmospheric pressure must be designed for the maximum low side working pressure. All connections must be designed, constructed, and installed to prevent leaks when connected.

(4) Where liquid transfer hose is not drained after transfer operations, the hose must have an approved shut-off valve at the discharge end. You must provide a method to prevent excessive hydrostatic pressure in the hose. (See WAC 296-307-40025.)

(5) On all hose 1/2-inch outside diameter and larger, used for the transfer of anhydrous ammonia liquid or vapor, you must ensure that the following information is etched, cast, or impressed at five-foot intervals:

- Anhydrous Ammonia
- xxx psig (Maximum working pressure)
- Manufacturer's Name or Trademark
- Year of Manufacture

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-40023, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-40023. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40023, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40025 What requirements apply to safety-relief devices? (1) Every container used in systems covered by WAC 296-307-400 must have one or more spring-loaded safety-relief valves or the equivalent.

(2) The discharge from safety-relief valves must be vented away from the container, upward, and unobstructed to the atmosphere. All safety-relief valve discharge openings must have suitable raincaps that allow free discharge of the vapor and prevent water from entering. You must provide a method to drain condensate. The rate of discharge must be as follows:

Surface Area sq. ft.	Flow Rate CFM Air	Surface Area sq. ft.	Flow Rate CFM Air	Surface Area sq. ft.	Flow Rate CFM Air
20	258	185	1,600	900	5,850
25	310	190	1,640	950	6,120
30	360	195	1,670	1,000	6,380
35	408	200	1,710	1,050	6,640
40	455	210	1,780	1,100	6,900
45	501	220	1,850	1,150	7,160
50	547	230	1,920	1,200	7,410
55	591	240	1,980	1,250	7,660
60	635	250	2,050	1,300	7,910

Surface Area sq. ft.	Flow Rate CFM Air	Surface Area sq. ft.	Flow Rate CFM Air	Surface Area sq. ft.	Flow Rate CFM Air
65	678	260	2,120	1,350	8,160
70	720	270	2,180	1,400	8,410
75	762	280	2,250	1,450	8,650
80	804	290	2,320	1,500	8,900
85	845	300	2,380	1,550	9,140
90	885	310	2,450	1,600	9,380
95	925	320	2,510	1,650	9,620
100	965	330	2,570	1,700	9,860
105	1,010	340	2,640	1,750	10,090
110	1,050	350	2,700	1,800	10,330
115	1,090	360	2,760	1,850	10,560
120	1,120	370	2,830	1,900	10,800
125	1,160	380	2,890	1,950	11,030
130	1,200	390	2,950	2,000	11,260
135	1,240	400	3,010	2,050	11,490
140	1,280	450	3,320	2,100	11,720
145	1,310	500	3,620	2,150	11,950
150	1,350	550	3,910	2,200	12,180
155	1,390	600	4,200	2,250	12,400
160	1,420	650	4,480	2,300	12,630
165	1,460	700	4,760	2,350	12,850
170	1,500	750	5,040	2,400	13,080
175	1,530	800	5,300	2,450	13,300
180	1,570	850	5,590	2,500	13,520

Surface area = total outside surface area of container in square feet. When the surface area is not stamped on the name plate or when the marking is not legible, calculate the area with one of the following formulas:

- Hemispherical heads: Area = (Length in feet) X (outside diameter in feet) X 3.1416.
- Other than hemispherical heads: Area = (Length in feet)+(0.3 outside diameter in feet) X (outside diameter in feet) X 3.1416.
- Spherical container: Area = (outside diameter in feet)² X 3.1416.
- Flow rate: CFM air = cubic feet per minute of air required at standard conditions, 60F and atmospheric pressure (14.7 psia).

For containers with total outside surface area greater than 2,500 sq. ft., the formula is: Flow rate CFM air = 22.11 A^{0.82} where A = outside surface area of the container in square feet.

(3) Container safety-relief valves must be set for start to discharge as follows, according to the design pressure of the container.

Containers	Minimum	Maximum*
ASME U-68, U-69	110%	125%
ASME U-200, U-201	95%	100%
ASME 1952, 1956, 1959, 1962, 1965, 1968 or 1971	95%	100%
API-ASME	95%	100%
U.S. Coast Guard	As required by USCG regulations	
DOT	As required by DOT regulations	

*Note: Plus a relief valve manufacturer's tolerance of ten percent.

(4) Safety-relief devices used in systems covered by WAC 296-307-400 must be constructed to discharge at a rate

equal to or greater than the rates required in subsection (2) of this section before the pressure exceeds 120% (not including the tolerance referred to in subsection (3) of this section) of the maximum permitted start-to-discharge pressure setting of the device.

(5) Safety-relief valves must be arranged to minimize tampering. If the pressure setting adjustment is external, the relief valves must have a sealable adjustment.

(6) Shut-off valves installed between the safety-relief valves and the containers or systems described in WAC 296-307-400 are prohibited.

Exception: A shut-off valve may be used where the arrangement of the valve allows the required capacity flow through the relief valves.

Exception example 1: A three-way valve installed under two safety-relief valves, each of which has the required rate of discharge and is installed to allow either of the safety-relief valves to be closed off, but does not allow both safety valves to be closed off at the same time.

Exception example 2: Two separate relief valves are installed with individual shut-off valves. The two shut-off valve stems must be mechanically interconnected to allow the full required flow of one safety-relief valve at all times.

Exception example 3: A safety-relief valve manifold that allows one valve of two, three, four or more to be closed off and the remaining valve or valves will provide not less than the rate of discharge shown on the manifold nameplate.

(7) Safety-relief valves must have direct communication with the vapor space of the container.

(8) Each safety-relief valve used with systems described in WAC 296-307-400 must be plainly and permanently marked as follows:

- (a) With the letters "AA" or the symbol NH3.
- (b) The pressure in pounds per square inch gauge (psig) at which the valve is set to start to discharge.
- (c) The rate of discharge of the valve in cubic feet per minute of air at 60°F and atmospheric pressure (14.7 psia).
- (d) The manufacturers name and catalog number.

For example: A safety-relief valve marked AA-250-4200 (air) mean the valve is suitable for use on an anhydrous ammonia container; that it is set to start to discharge at 250 psig; and that its rate of discharge is 4,200 cubic feet per minute of air.

(9) No connection to the safety-relief valve may restrict the flow capacity on either the upstream or downstream side.

(10) The manufacturer or supplier of a safety-relief valve manifold must publish complete data showing the flow rating through the combined assembly of the manifold with safety-relief valves installed. The manifold flow rating must be determined by testing the manifold with all but one valve discharging. The flow rate must be determined by the restricted opening or openings or those having the lowest flow. The valve must be marked as required in subsection (7) of this section.

(11) A hydrostatic relief valve must be installed between each pair of valves in the liquid ammonia piping or hose where liquid may be trapped to release into the atmosphere at a safe location.

(12) Discharge from safety-relief devices must not terminate in or beneath any building.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-40025, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-40025. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050

and [49.17.]060. 96-22-048, § 296-306A-40025, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40027 What emergency precautions are required when handling anhydrous ammonia? (1) You must train employees required to handle ammonia in the safe operating practices and the proper action to take in an emergency. Employees must be instructed to use the equipment listed in subsection (3) of this section in an emergency.

(2) If ammonia system leaks, the employees trained for and designated to act in emergencies must:

(a) See that anyone not required to deal with an emergency is evacuated from the contaminated area.

(b) Put on a suitable gas mask.

(c) Wear gauntlet type plastic or rubber gloves and wear plastic or rubber suits in heavily contaminated atmospheres.

(d) Shut off the appropriate valves.

(3) All storage systems must have on hand at least the following equipment for emergency and rescue purposes:

(a) *One full face gas mask with anhydrous ammonia refill canisters.

(b)**One pair of protective gloves.

(c)**One pair of protective boots.

(d)**One protective slicker and/or protective pants and jacket.

(e) Easily accessible shower and/or at least 50 gallons of clean water in an open top container.

(f) Tight-fitting vented goggles or one full face shield.

*An ammonia canister is effective for short periods of time in light concentrations of ammonia vapor, generally fifteen minutes in concentrations of 3% and will not protect breathing in heavier concentrations. If ammonia vapors are detected when mask is applied, the concentration is too high for safety. The life of a canister in service is controlled by the percentage of vapors to which it is exposed. Canisters must not be opened until ready for use and should be discarded after use. Unopened canisters may be guaranteed for as long as three years and all should be dated when received. In addition, an independently supplied air mask of the type used by fire departments may be used for severe emergencies.

**Gloves, boots, slickers, jackets, and pants must be made of rubber or other material impervious to ammonia.

(4) Where several persons are usually present, additional safety equipment may be necessary.

(5) Each tank motor vehicle transporting anhydrous ammonia, except farm applicator vehicles, must carry a container of at least five gallons of water and must have a full face gas mask, a pair of tight-fitting goggles or one full face shield. The driver must be instructed in their use and the proper action to take to provide for the driver's safety.

(6) If a leak occurs in transportation equipment and it is impractical to stop the leak, the driver should move the vehicle to an isolated location.

(7) If liquid ammonia contacts the skin or eyes, the affected area should be promptly and thoroughly flushed with water. Do not use neutralizing solutions or ointments on affected areas. A physician must treat all cases of eye exposure to liquid ammonia.

[Recodified as § 296-307-40027. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40027, filed 10/31/96, effective 12/1/96.]

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WAC 296-307-40029 What requirements apply to filling densities? Filling density means the percent ratio of the weight of the gas in a container to the weight of water at 60°F that the container will hold. One pound of water equals 27.737 cubic inches at 60°F. To determine the weight capacity of the tank in pounds, the weight of a gallon (231 cubic inches) of water at 60°F in air must be 8.32828 pounds.

(1) The filling densities for nonrefrigerated containers must not exceed the following:

	Aboveground	Underground
(i) Uninsulated	56%	58%
(ii) Insulated	57%	

(iii) DOT containers shall be filled according to DOT regulations.

This corresponds to 82% by volume at -28°F, 85% by volume at 5°F, 87.5% by volume at 30°F, and 90.6% by volume at 60°F.

(2) When containers are filled according to liquid level by any gauging method other than a fixed length dip tube gauge, each container should have a thermometer well so that the internal liquid temperature can be easily determined and the amount of liquid and vapor in the container corrected to a 60°F basis.

[Recodified as § 296-307-40029. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40029, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40031 What requirements apply to the transfer of liquids? (1) Anhydrous ammonia must always be at a temperature suitable for the material of construction and design of the receiving containers. Ordinary steels are not suitable for refrigerated ammonia. See Appendix R of API Standard 620 "Recommended Rules for Design and Construction of Large Welded Low-Pressure Storage Tanks" for materials for low temperature service.

(2) At least one attendant must supervise the transfer of liquids from the time the connections are first made until they are finally disconnected.

(3) Flammable gases or gases that will react with ammonia (such as air) must not be used to unload tank cars or transport trucks.

(4) Containers must be charged or used only on authorization of the owner.

(5) Containers must be gauged and charged only in the open atmosphere or in buildings approved for that purpose.

(6) Pumps used for transferring ammonia must be recommended and labeled for ammonia service by the manufacturer.

(a) Pumps must be designed for at least 250 psig working pressure.

(b) Positive displacement pumps must have installed, off the discharge port, a constant differential relief valve discharging into the suction port of the pump through a line large enough to carry the full capacity of the pump at relief valve setting. The setting and installation must be according to the pump manufacturer's recommendations.

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(c) On the discharge side of the pump, before the relief valve line, there must be a pressure gauge graduated from 0 to 400 psig installed.

(d) Plant piping must contain shut-off valves located as close as practical to pump connections.

(7) Compressors used for transferring or refrigerating ammonia must be recommended and labeled for ammonia service by the manufacturer.

(a) Compressors, except those used for refrigeration, must be designed for at least 250 psig working pressure. Crank cases of compressors not designed to withstand system pressure must be protected with a suitable safety-relief valve.

(b) Plant piping must have shut-off valves located as close as practical to compressor connections.

(c) A safety-relief valve large enough to discharge the full capacity of the compressor must be connected to the discharge before any shut-off valve.

(d) Compressors must have pressure gauges at suction and discharge graduated to at least one and one-half times the maximum pressure that can develop.

(e) Adequate means, such as drainable liquid trap, must be provided on the compressor suction to minimize the entry of liquid into the compressor.

(f) Where necessary to prevent contamination, an oil separator must be provided on the discharge side of the compressor.

(8) Loading and unloading systems must be protected by suitable devices to prevent emptying of the storage container or the container being loaded or unloaded if the hose is cut. Backflow check valves or properly sized excess flow valves must be installed where necessary to provide this protection. In the event that valves are not practical, remotely operated shut-off valves may be installed.

(9) Meters used to measure liquid anhydrous ammonia must be recommended and labeled for ammonia service by the manufacturer.

(a) Liquid meters must be designed for a minimum working pressure of 250 psig.

(b) The metering system must incorporate devices that will prevent the inadvertent measurement of vapor.

[Recodified as § 296-307-40031. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40031, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40033 What requirements apply to tank car unloading points and operations? (1) Provisions for unloading tank cars must meet DOT requirements.

(2) Unloading operations must be performed by reliable employees who are properly instructed and responsible for careful compliance with all procedures.

(3) Caution signs must be placed on the track or car to give necessary warning to anyone approaching car from the open end of the siding. The signs must be left up until after car is unloaded and disconnected from discharge connections. Signs must be of metal or other suitable material, at least 12 by 15 inches, and bear the words "STOP—Tank car connected" or "STOP—Men at work." The word "STOP" must be in letters at least four inches high and the other words in letters at least two inches high. The letters must be white on a blue background.

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(4) The track of a tank car siding must be substantially level.

(5) Brakes must be set and wheels blocked on all cars being unloaded.

(6) Tank cars of anhydrous ammonia must be unloaded only at approved locations meeting the requirements of WAC 296-307-40025(4) and 296-307-40031(8).

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-40033, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-40033. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40033, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40035 What requirements apply to the liquid-level gauging device? (1) Each container except those filled by weight must have an approved liquid-level gauging device.

(2) All gauging devices must be arranged so that the maximum liquid level to which the container is filled is easily determined.

(3) Gauging devices that require bleeding of the product to the atmosphere such as the rotary tube, fixed tube, and slip tube devices, must be designed so that the maximum opening of the bleed valve is a maximum of No. 54 drill size unless provided with an excess flow valve.

(4) Gauging devices must have a design pressure equal to or greater than the design pressure of the container on which they are installed.

(5) Fixed liquid-level gauges must be designed so that the maximum volume of the container filled by liquid is a maximum of 85% of its water capacity. The coupling into which the fixed liquid-level gauge is threaded must be placed at the 85% level of the container. If located elsewhere, the dip tube of this gauge must be installed so that it cannot be readily removed.

Note: This does not apply to refrigerated storage.

(6) Columnar gauge glasses must be restricted to stationary storage installation. They must have shut-off valves having metallic hand wheels, excess flow valves, and extra heavy glass adequately protected by a metal housing applied by the gauge manufacturer. They must be shielded against the direct rays of the sun.

[Recodified as § 296-307-40035. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40035, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40037 How should aboveground uninsulated containers be maintained? Aboveground uninsulated containers should have a reflective surface maintained in good condition. We recommend white for painted surfaces, but other light reflecting colors are acceptable.

[Recodified as § 296-307-40037. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-40037, filed 10/31/96, effective 12/1/96.]

WAC 296-307-40039 What requirements apply to electrical equipment and wiring? (1) Electrical equipment and wiring for use in ammonia installations must be general purpose or weather resistant as appropriate.

(2) Where concentrations of ammonia in the air in excess of 16% by volume are likely to be encountered, electrical

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equipment and wiring must be specified by and installed according to chapter 296-307 WAC Part T, for Class I, Group D locations.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-40039, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-40039, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-40039, filed 10/31/96, effective 12/1/96.]

Part U-2

Hazardous Materials—Liquefied Petroleum Gas

WAC 296-307-410 Storage and handling of liquefied petroleum gases.

[Recodified as § 296-307-410, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-410, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41001 What does this part cover?

Chapter 296-307 WAC Part U2 covers the storage and handling of liquefied petroleum gases.

The requirements of WAC 296-307-410 apply to all LP-gas installations covered by this part.

For additional requirements related to:	See WAC
Cylinder systems	296-307-415
Systems using non-DOT containers	296-307-420
LP-gas as a motor fuel	296-307-425
Storage of containers awaiting use or resale	296-307-430
LP-gas installations on commercial vehicles	296-307-435
LP-gas service stations	296-307-440

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-41001, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-41001, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-41001, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41003 Which LP-gas installations are not covered by this part? (1) This part does not apply to:

- (a) LP-gas refrigerated storage systems;
- (b) LP-gas used with oxygen;
- (c) LP-gas used in utility gas plants (covered by the National Fire Protection Association Standard for the Storage and Handling of Liquefied Petroleum Gases at Utility Gas Plants, NFPA No. 59-1968);

(d) Low-pressure (less than 1/2 pound per square inch or 14 inches water column) LP-gas piping systems, and the installation and operation of residential and commercial appliances supplied through such systems. The National Fire Protection Association Standard for the Installation of Gas Appliances and Gas Piping, NFPA 54-1969 apply to these systems.

(2) LP-gas installations, equipment, and appliances that met the requirements of the National Fire Protection Association Standard for the Storage and Handling of Liquefied Petroleum Gases NFPA No. 58-1972, 1973 at the time of manufacture or installation may be used if they do not create a hazard to employees.

[Recodified as § 296-307-41003, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-41003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41005 What definitions apply to this part? "Adequate ventilation," for fire prevention during nor-

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mal operation, means the concentration of the gas in a gas-air mixture does not exceed 25% of the lower flammable limit.

"Containers" means all vessels, such as tanks, cylinders, or drums, used to transport or store LP-gases.

"DOT" means the federal Department of Transportation.

"DOT container" means a container that meets DOT regulations.

"DOT cylinder" means a cylinder that meets DOT regulations.

"DOT regulations/requirements/specifications" means the DOT regulations of 49 CFR part 178.

"Liquefied petroleum gases" and "LP-gas" means any material that is composed mostly of any of the following: Hydrocarbons, or mixtures of them; propane; propylene; butanes (normal butane or iso-butane); and butylenes.

"PSIA" pounds per square inch absolute.

"PSIG" means pounds per square inch gauge.

"Systems" means an assembly of the container or containers, major devices such as vaporizers, safety-relief valves, excess flow valves, regulators, and piping connecting such parts.

"Vaporizer-burner" means an integral vaporizer-burner unit, dependent upon the heat generated by the burner to vaporize the liquid used for dehydrators or dryers.

[Recodified as § 296-307-41005, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-41005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41007 When must LP-gas be odorized? You must ensure that all LP-gas is odorized by an approved agent to indicate by distinct odor, the presence of gas down to concentration in air of a maximum of 1/5 the lower limit of flammability.

Exception: Odorization is not required if it will create a hazard in further processing, or if it serves no useful purpose as a warning agent.

Note: The odorization requirement may be met by using 1.0 pounds of ethyl mercaptan, 1.0 pounds of thiophene, or 1.4 pounds of amyl mercaptan per ten thousand gallons of LP-gas. You may use any odorant and quantity that meets the requirements of this section.

[Recodified as § 296-307-41007, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-41007, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41009 Must LP-gas containers and equipment be approved? (1) Each system of DOT containers must have approved container valves, connectors, manifold valve assemblies, and regulators.

(2) Each non-DOT system using containers of 2,000 gallons or less water capacity, must have a container assembly, one or more regulators, and other necessary parts. The entire system, or the container assembly with the regulators, must be individually listed by a nationally recognized testing laboratory.

"Container assembly" means the container and fittings for all openings, including shut-off valves, excess flow valves, liquid-level gauging devices, safety-relief devices, and protective housing.

(3) In systems using containers of over 2,000 gallons water capacity, each regulator, container, valve, excess flow

valve, gauging device, and relief valve, must be listed by a nationally recognized testing laboratory.

(4) All DOT containers must be constructed, tested, and stamped according to the DOT specifications effective at the date of their manufacture.

[Recodified as § 296-307-41009. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41011 What construction and test requirements must containers meet? (1) Containers must be designed, constructed, and tested according to the *Rules for Construction of Unfired Pressure Vessels, section VIII, Division 1, American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code*, 1968 edition, unless otherwise specified.

(2) Containers constructed according to the 1949 and earlier editions of the ASME Code are exempt from U-2 through U-10 and U-19 of the code. Containers constructed according to U-70 in the 1949 and earlier editions do not meet the requirements of this section.

(3) Containers designed, constructed, and tested prior to July 1, 1961, according to the *Code for Unfired Pressure Vessels for Petroleum Liquids and Gases*, 1951 edition with 1954 Addenda, of the American Petroleum Institute and the American Society of Mechanical Engineers are considered in compliance. Containers constructed according to API-ASME Code do not have to comply with section I or with the appendix to section I. W-601 through W-606 in the 1943 and earlier editions do not apply.

[Recodified as § 296-307-41011. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41011, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41013 How must containers be welded? (1) You must ensure that all welding to the shell, head, or any other part of the container subject to internal pressure, meets the requirements of the code under which the tank was fabricated. You may weld on saddle plates, lugs, or brackets attached to the container by the tank manufacturer.

(2) When you must repair or modify DOT containers by welding, you must return the container to a qualified manufacturer, making containers of the same type, to make the repair or modification according to DOT regulations.

[Recodified as § 296-307-41013. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41013, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41015 How must containers be marked? (1) You must ensure that containers are marked according to DOT regulations or with the following:

(a) Indication that the container meets the requirements of the code under which it is constructed, and all marks required by that code.

(b) Indication whether the container is designed for underground or aboveground installation or both. If intended for both and different style hoods are provided, the marking must indicate the proper hood for each type of installation.

(c) The name and address of the supplier of the container, or with the trade name of the container.

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(d) The water capacity of the container in pounds or gallons, United States standard.

(e) The pressure in psig, for which the container is designed.

(f) The wording "This container must not contain a product with a vapor pressure greater than _psig at 100°F."

(g) The tare weight, for containers with a water capacity of three hundred pounds or less.

(h) Indication of the maximum fill level for liquid at temperatures between 20° F and 130° F. Markings must be in maximum increments of 20° F. This marking may be located on the liquid level gauging device.

Exception: Containers provided with fixed maximum level indicators or that are filled by weighing are exempt from this requirement.

(i) The outside surface area in square feet.

(2) The markings must be on a metal nameplate attached to the container so that it is visible after the container is installed.

(3) When LP-gas and one or more other gases are stored or used in the same area, the containers must be marked to identify their content. Marking must be according to American National Standard Z48.1-1954, "Method of Marking Portable Compressed Gas Containers to Identify the Material Contained."

[Recodified as § 296-307-41015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41017 Where must containers be located? You must ensure that containers are located according to the following:

(1) Containers and first stage regulating equipment are located outdoors.

Containers may be located indoors under any of the following conditions:

(a) In buildings used exclusively for container charging, vaporization pressure reduction, gas mixing, gas manufacturing, or distribution;

(b) When portable use is necessary and meets the requirements of WAC 296-307-41509;

(c) LP-gas fueled stationary or portable engines that meet the requirements of WAC 296-307-42521 or 296-307-42523;

(d) LP-gas fueled industrial trucks that meet the requirements of WAC 296-307-42525;

(e) LP-gas fueled vehicles garaged according to WAC 296-307-42527; or

(f) Containers awaiting use or resale when stored according to WAC 296-307-430.

(2) Each individual container is located away from the nearest important building, group of buildings, or line of adjoining property that may be built on, according to Table U-1.

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TABLE U-1
Minimum distances

Water capacity per container	Containers		Between above-ground containers
	Under-ground	Above-ground	
Less than 125 gals ^a	10 feet	None	None
125-250 gals	10 feet	10 feet	None
251-500 gals	10 feet	10 feet	3 feet
501-2,000 gals	25 feet ^b	25 feet ^b	3 feet
2,001-30,000 gals	50 feet	50 feet	5 feet
30,001-70,000 gals	50 feet	75 feet	1/4 of sum of diameters of adjacent containers
70,001-90,000 gals	50 feet	100 feet	1/4 of sum of diameters of adjacent containers

(a) If the total water capacity of a multicontainer installation at a consumer site is 501 gallons or more, the minimum distance must comply with this table, applying the aggregate capacity instead of the capacity per container. For multiple installations, installations must be at least twenty-five feet apart. Do not apply the MINIMUM DISTANCES BETWEEN ABOVEGROUND CONTAINERS to such installations.

(b) Distance requirements may be reduced to 10 feet for a single container of 1200 gallons water capacity or less, if the container is at least 25 feet from any other LP-gas container of more than 125 gallons water capacity.

(c) In buildings devoted exclusively to gas manufacturing and distributing operations, the distances may be reduced if no containers of more than 500 gallons water capacity are located closer than ten feet to gas manufacturing and distributing buildings.

(3) Containers installed for use must not be stacked one above the other.

(4) In industrial installations involving containers of 180,000 gallons total water capacity or more, where serious exposures from the container to adjacent properties are common, firewalls or other means of protection designed and constructed according to good engineering practices are required.

(5) Readily ignitable material such as weeds and long dry grass is removed within ten feet of any container.

(6) The minimum separation between LP-gas containers and flammable liquid tanks is twenty feet; the minimum separation between a container and the centerline of the dike is ten feet.

Exception: This does not apply when LP-gas containers of 125 gallons or less capacity are installed adjacent to Class III flammable liquid tanks of 275 gallons or less capacity.

(7) The accumulation of flammable liquids under adjacent LP-gas containers is prevented by a means such as diking, diversion curbs, or grading.

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(8) When dikes are used with flammable liquid tanks, no LP-gas containers are located within the diked area.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-41017, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-41017, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-41017, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41019 What requirements apply to valves and accessories? (1) Valves, fittings, and accessories connected directly to the container including primary shut-off valves, must have a rated working pressure of at least 250 psig and must be of material and design suitable for LP-gas service. The use of cast iron for container valves, fittings, and accessories is prohibited. Container valves may be made of malleable or nodular iron.

(2) Connections to containers must have shut-off valves located as close to the container as practical.

Exception: This does not apply to safety-relief connections, liquid level gauging devices, and plugged openings.

(3) All required excess flow valves must close automatically at the rated flows of vapor or liquid specified by the manufacturer. The connections, lines, valves, and fittings must have a greater capacity than the rated flow of the excess flow valve.

(4) Liquid level gauging devices that are constructed so that outward flow is a maximum of that passed by a No. 54 drill size opening may be installed without excess flow valves.

(5) Openings from container or through fittings attached directly on container to which pressure gauge connection is made, need not have shut-off or excess flow valves if such openings are restricted to not larger than No. 54 drill size opening.

(6) Required excess flow and back pressure check valves must be located inside the container or outside where the line enters the container. When located outside, the installation must be made to prevent any stress beyond the excess flow or back pressure check valve from causing a break between the container and the valve.

Exception: This does not apply to systems using containers with a water capacity greater than 2-1/2 pounds (nominal one pound LP-gas capacity).

(7) Excess flow valves must be designed with a bypass that is a maximum of No. 60 drill size opening to allow equalization of pressures.

(8) Containers of more than 30 gallons water capacity and less than 2,000 gallons water capacity, filled on a volumetric basis, and manufactured after December 1, 1963, must be equipped for filling into the vapor space.

[Recodified as § 296-307-41019, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-41019, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41021 What requirements apply to piping, tubing, and fittings? (1) Pipe must be wrought iron or steel (black or galvanized), brass, copper, or aluminum alloy. Aluminum alloy pipe must be at least Schedule 40 according to the specifications for Aluminum Alloy Pipe, ANSI H38.7-1969 (ASTM, B241-1969), and must be suit-

ably marked at each end of each length indicating compliance with ANSI specifications. Alloy 5456 is prohibited.

Exception: This does not apply to piping for LP-gas used as a motor fuel or to piping on commercial vehicles.

(2) Aluminum alloy pipe must be protected against external corrosion whenever:

(a) It is in contact with dissimilar metals other than galvanized steel; or

(b) Its location is subject to repeated wetting by such liquids as water (except rain water), detergents, sewage, or leaking from other piping; or

(c) It passes through flooring, plaster, masonry, or insulation.

Galvanized sheet steel or pipe, galvanized inside and out, are considered suitable protection.

(3) Aluminum pipe must be three-fourths inch nominal and shall not be used for pressures exceeding 20 psig. Aluminum alloy pipe must not be installed within six inches of the ground.

(a) Vapor piping with operating pressures not exceeding 125 psig must be suitable for a working pressure of at least 125 psig. Pipe must be at least Schedule 40 ASTM A-53-69, Grade B Electric Resistance Welded and Electric Flash Welded Pipe or equal.

(b) Vapor piping with operating pressures over 125 psig and all liquid piping must be suitable for a working pressure of at least 250 psig. Pipe must be at least Schedule 80 if joints are threaded or threaded and back welded. At least Schedule 40 (ASTM A-53-1969 Grade B Electric Resistance Welded and Electric Flash Welded Pipe or equal) must be used if joints are welded, or welded and flanged.

(4) Tubing must be seamless copper, brass, steel, or aluminum alloy. Copper tubing must be of Type K or L or equivalent as covered in the Specification for Seamless Copper Water Tube, ANSI H23.1-1970 (ASTM B88-1969). Aluminum alloy tubing must be of Type A or B or equivalent as covered in Specification ASTM B210-1968 and must be suitably marked every 18 inches indicating compliance with ASTM specifications. The minimum nominal wall thickness of copper tubing and aluminum alloy tubing must be as specified in Table U-2 and Table U-3.

TABLE U-2
WALL THICKNESS OF COPPER TUBING¹

Note: The standard tube size is one-eighth-inch smaller than its nominal outside diameter.

Standard size (inches)	Nominal O.D. (inches)	Nominal wall thickness (inches)	
		Type K	Type L
1/4	0.375	0.035	0.030
3/8	0.500	0.049	0.035
1/2	0.625	0.049	0.040
5/8	0.750	0.049	0.042
3/4	0.875	0.065	0.045
1	1.125	0.065	0.050
1 1/4	1.375	0.065	0.055
1 1/2	1.625	0.072	0.060
2	2.125	0.083	0.070

¹Based on data in Specification for Seamless Copper Water Tubing, ANSI H23.1-1970 (ASTM B-88-69).

TABLE U-3
WALL THICKNESS OF ALUMINUM ALLOY TUBING¹

Outside diameter (inches)	Nominal wall thickness (inches)	
	Type A	Type B
3/8	0.035	0.049
1/2	0.035	0.049
5/8	0.042	0.049
3/4	0.049	0.058

¹Based on data in Standard Specification for Aluminum-Alloy Drawn Seamless Coiled Tubes for Special Purpose Applications, ASTM B210-68.

(5) Aluminum alloy tubing must be protected against external corrosion whenever:

(a) It is in contact with dissimilar metals other than galvanized steel; or

(b) Its location is subject to repeated wetting by liquids such as water (except rainwater), detergents, sewage, or leakage from other piping; or

(c) It passes through flooring, plaster, masonry, or insulation.

Galvanized sheet steel or pipe, galvanized inside and out, are considered suitable protection.

(6) The maximum outside diameter for aluminum alloy tubing must be three-fourths inch and must not be used for pressures exceeding 20 psig. Aluminum alloy tubing installed within six inches of the ground is prohibited.

(7) In systems where the gas in liquid form enters the building without pressure reduction, only heavy walled seamless brass or copper tubing with an internal diameter a maximum of 3/32 inch, and a wall thickness of at least 3/64 inch shall be used.

Exception: This requirement does not apply to research and experimental laboratories, buildings or separate fire divisions of buildings used exclusively for housing internal combustion engines, and to commercial gas plants or bulk stations where containers are charged, nor to industrial vaporizer buildings, nor to buildings, structures, or equipment under construction or undergoing major renovation.

(8) Pipe joints must be screwed, flanged, welded, soldered, or brazed with a material having a melting point over 1,000°F. Joints on seamless copper, brass, steel, or aluminum alloy gas tubing shall be made by approved gas tubing fittings, or soldered or brazed with a material having a melting point over 1,000°F.

(9) For operating pressures of 125 psig or less, fittings must be designed for a pressure of at least 125 psig. For operating pressures above 125 psig, fittings must be designed for a minimum of 250 psig.

(10) Threaded cast iron pipe fittings are prohibited. Aluminum alloy fittings must be used with aluminum alloy pipe and tubing. Insulated fittings must be used where aluminum alloy pipe or tubing connects with a dissimilar metal. You may use malleable, nodular, or higher strength gray iron for fittings.

Note: Strainers, regulators, meters, compressors, pumps, etc., are not to be considered as pipe fittings.

(11) All materials such as valve seats, packing, gaskets, diaphragms, etc., must be resistant to the action of LP-gas under the service conditions to which they are subjected.

(12) All piping, tubing, or hose must be tested after assembly and proved free from leaks at least normal operating pressures. After installation, piping and tubing of all domestic and commercial systems must be tested and proved free of leaks using a manometer or equivalent device that will indicate a drop in pressure. Test made by flame is prohibited.

(13) You must ensure that piping allows for expansion, contraction, jarring, and vibration, and settling. You may use flexible connections.

(14) Piping outside buildings may be buried, above-ground, or both, but must be well supported and protected against physical damage. Where soil conditions warrant, all piping must be protected against corrosion. Where condensation may occur, the piping must be pitched back to the container, or you must provide a means for revaporization of the condensate.

[Recodified as § 296-307-41021. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41021, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41023 What specifications must hoses meet? (1) Hose shall be fabricated of materials that are resistant to the action of LP-gas in the liquid and vapor phases. If wire braid is used for reinforcing the hose, it must be of corrosion-resistant material such as stainless steel.

(2) Hose subject to container pressure must be marked "LP-gas" or "LPG" at not greater than ten-foot intervals.

(3) Hose subject to container pressure must be designed for a bursting pressure of not less than 1,250 psig.

(4) Hose subject to container pressure must be listed by a nationally recognized testing laboratory.

(5) Hose connections subject to container pressure must be able to withstand, without leaking, a test pressure of not less than 500 psig.

(6) Hose and hose connections on the low-pressure side of the regulator or reducing valve must be designed for a bursting pressure of not less than 125 psig or five times the set pressure of the relief devices protecting that portion of the system, whichever is higher.

(7) Hose may be used on the low-pressure side of regulators to connect to other than domestic and commercial gas appliances under the following conditions:

(a) The appliances connected with hose are portable and need a flexible connection.

(b) For use inside buildings, the hose is of minimum practical length, but is a maximum of six feet. Hose must not extend from one room to another, nor pass through any walls, partitions, ceilings, or floors. Such hose must not be concealed from view or used in a concealed location.

Exception: For use outside of buildings, the hose may exceed this length but must be kept as short as practical.

(c) The hose must be approved and must not be used where it may be exposed to temperatures above 125°F. The hose must be securely connected to the appliance. Rubber slip ends are prohibited.

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(d) The shut-off valve for an appliance connected by hose must be in the metal pipe or tubing and not at the appliance end of the hose. When shut-off valves are installed close to each other, precautions must be taken to prevent operation of the wrong valve.

(e) Hose used for connecting to wall outlets must be protected from physical damage.

[Recodified as § 296-307-41023. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41023, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41025 What requirements apply to safety devices? (1) Every container except those constructed according to DOT specifications and every vaporizer (except motor fuel vaporizers and vaporizers described in WAC 296-307-41029(3) and 296-307-42007 (6)(a) whether heated by artificial means or not, must have one or more safety-relief valves of spring-loaded or equivalent type. These valves must be arranged to afford free vent to the outer air with discharge not less than five feet horizontally away from any opening into the building that is below such discharge. The rate of discharge must be according to the requirements of subsection (2) or (4) of this section.

(2) Minimum required rate of discharge in cubic feet per minute of air at one hundred twenty percent of the maximum permitted start to discharge pressure for safety-relief valves to be used on containers other than those constructed according to DOT specification must be as follows:

Surface area sq. ft.	Flow rate CFM air	Surface area sq. ft.	Flow rate CFM air	Surface area sq. ft.	Flow rate CFM air
20 or less	626	170	3,620	550	9,470
25	751	175	3,700	600	10,170
30	872	180	3,790	650	10,860
35	990	185	3,880	700	11,550
40	1,100	190	3,960	750	12,220
45	1,220	195	4,050	800	13,540
50	1,330	200	4,130	850	14,190
55	1,430	210	4,300	900	14,830
60	1,540	220	4,470	1,000	15,470
65	1,640	230	4,630	1,050	16,100
70	1,750	240	4,800	1,100	16,720
75	1,850	250	4,960	1,150	17,350
80	1,950	260	5,130	1,200	17,960
85	2,050	270	5,290	1,250	18,570
90	2,150	280	5,450	1,300	19,180
95	2,240	290	5,610	1,350	19,780
100	2,340	300	5,760	1,400	20,380
105	2,440	310	5,920	1,450	20,980
110	2,530	320	6,080	1,500	21,570
115	2,630	330	6,230	1,550	22,160
120	2,720	340	6,390	1,600	22,740
125	2,810	350	6,540	1,650	23,320
130	2,900	360	6,690	1,700	23,900
135	2,990	370	6,840	1,750	24,470
140	3,080	380	7,000	1,800	25,050
145	3,170	390	7,150	1,850	25,620
150	3,260	400	7,300	1,900	26,180
155	3,350	450	8,040	1,950	26,750

160	3,440	500	8,760	2,000	27,310
165	3,530				

Surface area = total outside surface area of container in square feet.

(3) When the surface area is not stamped on the name plate or when the marking is not legible, calculate the area with one of the following formulas:

- Hemispherical heads: Area = (overall length) X (outside diameter) X 3.1416.
- Other than hemispherical heads: Area = (overall length) + 0.3 (outside diameter) X (outside diameter) X 3.1416.

Note: This formula is not exact, but will give results within the limits of practical accuracy for the sole purpose of sizing relief valves.

- Spherical container: Area = (outside diameter)² X 3.1416.
- Flow rate: CFM air = required flow capacity in cubic feet per minute of air at standard conditions, 60°F and atmospheric pressure (14.7 psia).

For containers with total outside surface area greater than 2,000 sq. ft., the formula is: Flow rate CFM air = 53.632 A^{0.82} where A = outside surface area of the container in square feet.

Valves not marked "air" have flow rate marking in cubic feet per minute of LP-gas. These can be converted to ratings in cubic feet per minute of air by multiplying the LP-gas ratings by factors listed below. Air flow ratings can be converted to ratings in cubic feet per minute of LP-gas by dividing the air ratings by the factors listed below.

AIR CONVERSION FACTORS

Container type	100	125	150	175	200
Air conversion factor	1.162	1.142	1.113	1.078	1.010

(4) The minimum required rate of discharge for safety-relief valves for LP-gas vaporizers (steam heated, water heated, and direct fired) must be determined as follows:

- (a) Obtain the total surface area by adding the surface area of vaporizer shell in square feet directly in contact with LP-gas and the heat exchanged surface area in square feet directly in contact with LP-gas.
- (b) Obtain the minimum required rate of discharge in cubic feet of air per minute, at 60°F and 14.7 psia from subsection (2) of this section, for this total surface area.

(5) Container and vaporizer safety-relief valves must be set to start to discharge, with relation to the design pressure of the container, according to the following:

Containers	Minimum (percent)	Maximum (percent)
ASME Code; Par. U-68, U-69—1949 and earlier editions	110	*125
ASME Code; Par. U-200, U-201—1949 edition	88	*100
ASME Code—1950, 1952, 1956, 1959, 1962, 1965 and 1968 (Division I) editions	88	*100
API—ASME Code—all editions	88	*100

[Title 296 WAC—p. 2612]

Containers	Minimum (percent)	Maximum (percent)
DOT	As prescribed in 49 CFR Chapter I	

* Manufacturers of safety-relief valves are allowed a plus tolerance not exceeding 10% of the set pressure marked on the valve.

(6) Safety-relief devices used with systems employing non-DOT containers must be constructed to discharge at not less than the rates shown in subsection (2) of this section, before the pressure is in excess of 120% of the maximum (not including the 10% referred to in subsection (5) of this section) permitted start-to-discharge pressure setting of the device.

(7) In high temperature areas, you must use a lower vapor pressure product or a higher designed pressure vessel to prevent the safety valves from opening. The tanks may be protected by cooling devices such as spraying, shading, or other means.

(8) Safety-relief valves must be arranged to minimize tampering. For external pressure setting or adjustment, the relief valves must have an approved sealable adjustment.

(9) Shut-off valves are prohibited between safety-relief devices and the container, equipment, or piping.

EXCEPTION: A shut-off valve may be used where the arrangement of the valve allows the required capacity flow through the safety-relief device.

(10) Safety-relief valves must have direct communication with the vapor space of the container.

(11) Each safety-relief valve must be plainly and permanently marked with the following:

- (a) Container type of the pressure vessel on which the valve is designed to be installed;
- (b) The pressure in psig at which the valve is set to discharge;
- (c) The actual rate of discharge of the valve in cubic feet per minute of air at 60°F and 14.7 psia; and
- (d) The manufacturer's name and catalog number.

For example: T200-250-4050 AIR: Indicates that the valve is suitable for use on a Type 200 container, that it is set to start to discharge at 250 psig; and that its rate of discharge is 4,050 cubic feet per minute of air.

(12) Safety-relief valve assemblies and their connections must be large enough to provide the required rate of flow for the container on which they are installed.

(13) A hydrostatic relief valve must be installed between each pair of shut-off valves on LP-gas liquid piping. The start-to-discharge pressure setting of such relief valves must be a maximum of 500 psig. The minimum setting on relief valves installed in piping connected to non-DOT containers shall be 140% of the container relief valve setting. For piping connected to DOT containers, the minimum must be 400 psig. The relief valve should not be installed in the pump discharge piping if the same protection can be provided by installing the relief valve in the suction piping. The start-to-discharge pressure setting of such a relief valve, if installed on the discharge side of a pump, must exceed the maximum pressure permitted by the recirculation device in the system.

(14) The discharge from any safety-relief device must not terminate in or beneath any building.

Exception: This requirement does not apply to relief devices covered by WAC 296-307-41017(1), 296-307-41507(1), or 296-307-41509.

(15) Container safety-relief devices and regulator relief vents must be located at least five feet in any direction from air openings into sealed combustion system appliances or mechanical ventilation air intakes.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-41025, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-41025. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41025, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41027 How must indirect fired vaporizers be constructed and installed? Indirect fired vaporizers utilizing steam, water, or other heating medium must be constructed and installed according to the following:

(1) Vaporizers must be constructed according to the requirements of WAC 296-307-41011 and must be permanently marked as follows:

(a) With the code marking signifying the specifications to which the vaporizer is constructed;

(b) With the allowable working pressure and temperature for which the vaporizer is designed;

(c) With the sum of the outside surface area and the inside heat exchange surface area expressed in square feet; and

(d) With the name or symbol of the manufacturer.

(2) Vaporizers with an inside diameter of six inches or less exempted by the ASME Unfired Pressure Vessel Code, Section VIII of the ASME Boiler and Pressure Vessel Code, 1968, must have a design pressure of at least 250 psig and need not be permanently marked.

(3) Heating or cooling coils installed inside a storage container are prohibited.

(4) Vaporizers may be installed in buildings, rooms, sheds, or lean-tos used exclusively for gas manufacturing or distribution, or in other light, noncombustible structures that are well ventilated near the floor line and roof.

Exception: When vaporizing and/or mixing equipment is in a structure not used exclusively for gas manufacturing or distribution, the structure or room must be separated from the remainder of the building. The separation must be a wall designed to withstand a static pressure of at least 100 pounds per square foot. This wall must have no openings or pipe or conduit passing through it. Such structure or room must have adequate ventilation and must have a roof or at least one exterior wall of lightweight construction.

(5) All DOT vaporizers must have, at or near the discharge, a safety-relief valve providing an effective rate of discharge according to WAC 296-307-41025.

(6) The heating medium lines into and out of the vaporizer must have a mechanism to prevent the flow of gas into the heat systems in the event of tube rupture in the vaporizer. Vaporizers must have an automatic means to prevent liquid from passing through the vaporizers to the gas discharge piping.

(7) The device that supplies heat to produce steam, hot water, or other heat may be installed in a building, compartment, room, or lean-to ventilated near the floorline and roof

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to the outside. The device must be separated from all compartments or rooms containing LP-gas vaporizers, pumps, and central gas mixing devices by a wall designed to withstand a static pressure of at least 100 pounds per square foot. This wall must have no openings or pipes or conduit passing through it.

Exception: This requirement does not apply to the domestic water heaters that may supply heat for a vaporizer in a domestic system.

(8) Gas-fired heating systems supplying heat exclusively for vaporization must have automatic safety devices to shut off the flow of gas to main burners, if the pilot light should fail.

(9) Vaporizers may be an integral part of a fuel storage container directly connected to the liquid section or gas section or both.

(10) Fusible plugs are prohibited on vaporizers.

(11) Vaporizer houses must not have unprotected drains to sewers or sump pits.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-41027, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-41027. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41027, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41029 How must atmospheric vaporizers be constructed and installed? Atmospheric vaporizers using heat from the ground or surrounding air must be installed as follows:

(1) Buried underground; or

(2) Located inside the building near where the pipe enters the building, if the capacity of the unit does not exceed one quart;

(3) Vaporizers of less than one quart capacity heated by the ground or surrounding air, may be installed without safety-relief valves if tests show that the assembly is safe.

[Recodified as § 296-307-41029. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41029, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41031 How must direct gas-fired vaporizers be constructed and installed? Direct gas-fired vaporizers must be constructed, marked, and installed as follows:

(1) According to the requirements of the *American Society of Mechanical Engineers Boiler and Pressure Vessel Code*, 1968, that apply to the maximum working conditions for which the vaporizer is designed.

(2) With the name of the manufacturer; rated Btu input to the burner; the area of the heat exchange surface in square feet; the outside surface of the vaporizer in square feet; and the maximum vaporizing capacity in gallons per hour.

(3) Vaporizers may be connected to the liquid section or the gas section of the storage container, or both. The container must have a manually operated valve in each connection that completely shuts off when desired, all flow of gas or liquid from container to vaporizer.

(4) Vaporizers with a maximum capacity of 35 gallons per hour must be located at least 5 feet from container shut-off valves. Vaporizers more than 35 gallon capacity but a maximum of 100 gallons per hour must be located at least 10

feet from the container shut-off valves. Vaporizers having a capacity greater than 100 gallons per hour must be located at least 15 feet from container shut-off valves.

(5) Vaporizers may be installed in buildings, rooms, housings, sheds, or lean-tos used exclusively for vaporizing or mixing of LP-gas. Vaporizing housing structures must be noncombustible, and well ventilated near the floorline and the highest point of the roof. When vaporizer and/or mixing equipment is located in a structure or room attached to or within a building, such structure or room must be separated from the remainder of the building by a wall designed to withstand a static pressure of at least 100 pounds per square foot. This wall must have no openings or pipes or conduit passing through it. The structure or room must have adequate ventilation, and a roof or at least one exterior wall of light-weight construction.

(6) Vaporizers must have at or near the discharge, a safety-relief valve providing an effective rate of discharge according to WAC 296-307-41025. The relief valve must be located where it is not subjected to temperatures over 140°F.

(7) Vaporizers must have suitable automatic means to prevent liquid passing from the vaporizer to the gas discharge piping of the vaporizer.

(8) Vaporizers must have means for manually turning off the gas to the main burner and pilot.

(9) Vaporizers must have automatic safety devices to shut off the flow of gas to main burners if the pilot light should fail. When the flow through the pilot exceeds 2,000 Btu per hour, the pilot also must have an automatic safety device to shut off the flow of gas to the pilot should the pilot flame be extinguished.

(10) Pressure regulating and pressure reducing equipment located within 10 feet of a direct fired vaporizer must be separated from the open flame by an airtight noncombustible partition.

(11) Except as provided in subsection (5) of this section, the following minimum distances must be maintained between direct fired vaporizers and the nearest important building, group of buildings, or line of adjoining property that may be built on:

- (a) Ten feet for vaporizers with a vaporizing capacity of 15 gallons per hour or less;
- (b) Twenty-five feet for vaporizers with a vaporizing capacity of 16-100 gallons per hour;
- (c) Fifty feet for vaporizers with a vaporizing capacity over 100 gallons per hour.

(12) Direct fired vaporizers must not raise the product pressure above the design pressure of the vaporizer equipment or above the pressure shown in the second column of Table U-8.

(13) Fusible plugs are prohibited on vaporizers.

(14) Vaporizers must not have unprotected drains to sewers or sump pits.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-41031, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-41031, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-41031, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41033 How must direct gas-fired tank heaters be constructed and installed? Direct gas-fired tank heaters must be constructed and installed as follows:

(1) Direct gas-fired tank heaters, and tanks to which they are applied, must only be installed aboveground.

(2) Tank heaters must be permanently marked with the name of the manufacturer, the rated Btu input to the burner, and the maximum vaporizing capacity in gallons per hour.

Note: Tank heaters may be an integral part of a fuel storage container directly connected to the container liquid section, or vapor section, or both.

(3) Tank heaters must have a means for manually turning off the gas to the main burner and pilot.

(4) Tank heaters must have an automatic safety device to shut off the flow of gas to main burners, if the pilot light should fail. When flow through pilot exceeds 2,000 Btu per hour, the pilot also must have an automatic safety device to shut off the flow of gas to the pilot should the pilot flame be extinguished.

(5) Pressure regulating and pressure reducing equipment if located within ten feet of a direct fired tank heater must be separated from the open flame by a substantially airtight non-combustible partition.

(6) The following minimum distances must be maintained between a storage tank heated by a direct fired tank heater and the nearest important building, group of buildings, or line of adjoining property that may be built on:

- (a) Ten feet for storage containers of less than 500 gallons water capacity;
- (b) Twenty-five feet for storage containers of 500-1,200 gallons water capacity;
- (c) Fifty feet for storage containers of over 1,200 gallons water capacity.

(7) No direct fired tank heater may raise the product pressure within the storage container over 75% of the pressure in the second column of Table U-8.

[Recodified as § 296-307-41033, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-41033, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41035 How must dehydrators be constructed and installed? The vaporizer section of vaporizer-burners used for dehydrators or dryers must be located outside doors; they must be constructed and installed as follows:

(1) Vaporizer-burners must have a minimum design pressure of 250 psig with a factor safety of five.

(2) Manually operated positive shut-off valves must be located at the containers to shut off all flow to the vaporizer-burners.

(3) Minimum distances between storage containers and vaporizer-burners must be as follows:

Water capacity per container (gallons)	Minimum distances (feet)
Less than 501	10
501 to 2,000	25
Over 2,000	50

(4) The vaporizer section of vaporizer-burners must be protected by a hydrostatic relief valve. The relief valve must

be located where it is not subjected to temperatures over 140°F. The start-to-discharge pressure setting must protect the components involved, and be at least 250 psig. The discharge must be directed upward and away from component parts of the equipment and away from operating personnel.

(5) Vaporizer-burners must have means for manually turning off the gas to the main burner and pilot.

(6) Vaporizer-burners must have automatic safety devices to shut off the flow of gas to the main burner and pilot in the event the pilot is extinguished.

(7) Pressure regulating and control equipment must be located or protected so that the temperatures surrounding this equipment shall not exceed 140°F.

Exception: Equipment components may be used at higher temperatures if designed to withstand such temperatures.

(8) Pressure regulating and control equipment when located downstream of the vaporizer must be designed to withstand the maximum discharge temperature of the vapor.

(9) Fusible plugs are prohibited on the vaporizer section of vaporizer-burners.

(10) Vaporizer coils or jackets must be made of ferrous metal or high temperature alloys.

(11) Equipment utilizing vaporizer-burners must have automatic shut-off devices upstream and downstream of the vaporizer section connected so as to operate in the event of excessive temperature, flame failure, and, if applicable, insufficient airflow.

[Recodified as § 296-307-41035, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41035, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41037 What are the maximum filling densities? (1) "Filling density" means the percent ratio of the weight of the gas in a container to the weight of water the container will hold at 60°F. All containers shall be filled according to the filling densities shown in Table U-4.

**TABLE U-4
MAXIMUM PERMITTED FILLING DENSITY**

Specific Gravity at 60°F (15.6°C)	Aboveground containers		Underground containers, all capacities
	0 to 1,200 U.S. gals. (1,000 imp. gal. 4,500 liters) total water cap	0 to 1,200 U.S. gals. (1,000 imp. gal. 4,500 liters) total water cap	
	Percent	Percent	
.496-.503	41	44	45
.504-.510	42	45	46
.511-.519	43	46	47
.520-.527	44	47	48
.528-.536	45	48	49
.537-.544	46	49	50
.545-.552	47	50	51
.553-.560	48	51	52
.561-.568	49	52	53
.569-.576	50	53	54
.577-.584	51	54	55
.585-.592	52	55	56
.593-.600	53	56	57

(2) Any container including mobile cargo tanks and portable tank containers regardless of size or construction, shipped under DOT jurisdiction or constructed according to

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DOT specifications must be charged according to DOT requirements.

(3) Exception: Portable containers not subject to DOT jurisdiction must be filled either by weight, or by volume using a fixed length dip tube gauging device.

[Recodified as § 296-307-41037, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41037, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41039 What requirements apply to LP-gas in buildings? (1) Vapor may be piped into buildings at pressures over 20 psig only if the buildings or separate areas thereof:

(a) Are constructed according to this section;

(b) Are used exclusively to house equipment for vaporization, pressure reduction, gas mixing, gas manufacturing, or distribution, or to house internal combustion engines, industrial processes, research and experimental laboratories, or equipment and processes using such gas and having similar hazard;

(c) Are buildings, structures, or equipment under construction or undergoing major renovation.

(2) Liquid may be permitted in buildings as follows:

(a) In buildings, or separate areas of buildings, used exclusively to house equipment for vaporization, pressure reduction, gas mixing, gas manufacturing, or distribution, or to house internal combustion engines, industrial processes, research and experimental laboratories, or equipment and processes using such gas and having similar hazard; and when such buildings, or separate areas are constructed according to this section.

(b) In buildings, structures, or equipment under construction or undergoing major renovation if the temporary piping meets the following conditions:

(i) Liquid piping inside the building meets the requirements of WAC 296-307-41021 and is a maximum of three-fourths iron pipe size. Copper tubing with an outside diameter of 3/4 inch or less may be used if it meets the requirements of Type K of Specifications for Seamless Water Tube, ANSI H23.1-1970 (ASTM B88-1969). (See Table U-2.) All such piping must be protected against construction hazards. Liquid piping inside buildings must be kept to a minimum. Such piping must be securely fastened to walls or other surfaces to provide adequate protection from breakage and located to subject the liquid line to the lowest ambient temperatures.

(ii) A shut-off valve must be installed in each intermediate branch line where it takes off the main line and must be readily accessible. A shut-off valve must also be placed at the appliance end of the intermediate branch line. Such shut-off valve must be upstream of any flexible connector used with the appliance.

(iii) Suitable excess flow valves must be installed in the container outlet line supplying liquid LP-gas to the building. A suitable excess flow valve must be installed immediately downstream of each shut-off valve. Excess flow valves must be installed where piping size is reduced and must be sized appropriately.

(iv) Hydrostatic relief valves must be installed according to WAC 296-307-41025(13).

(v) Using hose to carry liquid between the container and the building or at any point in the liquid line, except at the appliance connector, is prohibited.

(vi) Where flexible connectors are necessary for appliance installation, such connectors must be as short as practical and must meet the requirements of WAC 296-307-41021(4) or 296-307-41023.

(vii) Release of fuel when any section of piping or appliances is disconnected must be minimized by either of the following methods:

(A) Using an approved automatic quick-closing coupling (closing in both directions when coupled in the fuel line); or

(B) Closing the valve nearest to the appliance and allowing the appliance to operate until the fuel in the line is consumed.

(viii) See WAC 296-307-41509 for the conditions under which portable containers may be brought indoors.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-41039, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-41039, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-41039, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41041 What requirements apply to transfer of liquids? When transferring liquids, you must ensure that:

(1) At least one attendant remains close to the transfer connection from the time the connections are first made until they are finally disconnected, during the transfer of the product.

(2) Containers must be filled or used only upon authorization of the owner.

(3) Containers manufactured according to DOT specifications authorized by DOT as a "single trip" or "nonrefillable container" must not be refilled or reused in LP-gas service.

(4) Gas or liquid must not be vented to the atmosphere to assist in transferring contents of one container to another, except as provided in WAC 296-307-42509(4). A listed pump may use LP-gas in the vapor phase as a source of energy. The gas may be vented to the atmosphere at a rate not to exceed that from a No. 31 drill size opening, if venting and liquid transfer are located at least 50 feet from the nearest important building.

(5) Filling fuel containers for industrial trucks or motor vehicles from industrial bulk storage containers must be performed at least ten feet from the nearest important masonry-walled building or at least twenty-five feet from the nearest important building or other construction and always at least 25 feet from any building opening.

(6) Filling portable containers, containers mounted on skids, fuel containers on farm tractors, or similar applications, from storage containers used in domestic or commercial service, must be performed at least 50 feet from the nearest important building.

(7) The filling connection and the vent from the liquid level gauges in containers, filled at point of installation, must be at least ten feet in any direction from air openings into sealed combustion system appliances or mechanical ventilation air intakes.

[Title 296 WAC—p. 2616]

(8) Fuel supply containers must be gauged and charged only in the open air or in buildings especially provided for that purpose.

(9) Marketers and users must exercise precaution to ensure that only those gases for which the system is designed, examined, and listed, are employed in its operation, particularly with regard to pressures.

(10) Pumps or compressors must be designed for use with LP-gas. When compressors are used they must normally take suction from the vapor space of the container being filled and discharge to the vapor space of the container being emptied.

(11) Pumping systems, when equipped with a positive displacement pump, must include a recirculating device that limits the differential pressure on the pump under normal operating conditions to the maximum differential pressure rating of the pump. The discharge of the pumping system must be protected so that pressure is a maximum of 350 psig. If a recirculation system discharges into the supply tank and contains a manual shut-off valve, an adequate secondary safety recirculation system must be incorporated that has no means of rendering it inoperative. Manual shut-off valves in recirculation systems must be kept open except during an emergency or when repairs are being made to the system.

(12) When necessary, unloading piping or hoses must have suitable bleeder valves for relieving pressure before disconnection.

(13) Agricultural air moving equipment, including crop dryers, shall be shut down when supply containers are filling unless the air intakes and sources of ignition on the equipment are located 50 feet or more from the container.

(14) Agricultural equipment employing open flames or equipment with integral containers, such as flame cultivators, weed burners, and tractors, must be shut down during refueling.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-41041, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-41041, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-41041, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41043 Must workers be trained? Workers performing installation, removal, operation, and maintenance work must be properly trained in that function.

[Recodified as § 296-307-41043, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-41043, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41045 What fire protection must be provided for LP-gas installations? (1) Open flames or other sources of ignition are prohibited in vaporizer rooms (except those housing direct-fired vaporizers), pumphouses, container charging rooms or other similar locations. Direct-fired vaporizers are prohibited in pumphouses or container charging rooms.

Note: LP-gas storage containers do not require lightning protection. Since LP-gas is contained in a closed system of piping and equipment, the system need not be electrically conductive or electrically bonded for protection against static electricity. (See NFPA No. 77-1972-1973, Recommended Practice for Static Electricity.)

(1999 Ed.)

(2) Open flames (except as provided in subsection (1) of this section), cutting or welding, portable electric tools, and extension lights capable of igniting LP-gas, are prohibited within classified areas specified in Table U-5 unless the LP-gas facilities have been freed of all liquid and vapor, or special precautions observed under carefully controlled conditions.

[Recodified as § 296-307-41045. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41045, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41047 What electrical requirements apply to LP-gas installations? (1) Electrical equipment and wiring must be specified by and installed according to chapter 296-307 WAC Part T, for ordinary locations.

(2) Fixed electrical equipment and wiring installed within classified areas must comply with Table U-5 and must be installed according to chapter 296-307 WAC Part T.

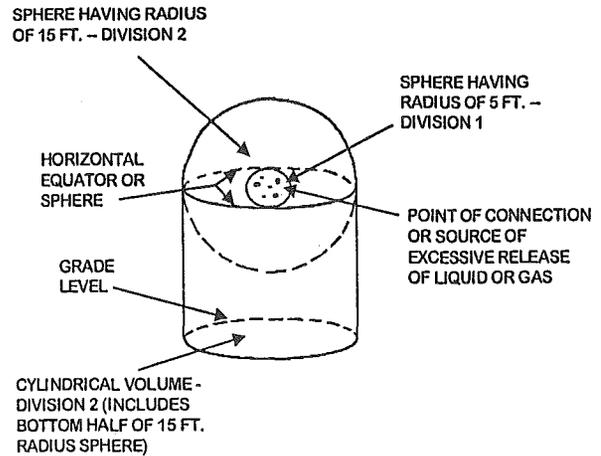
EXCEPTION: This provision does not apply to fixed electrical equipment at residential or commercial installations of LP-gas systems, LP-gas used as a motor fuel, or to LP-gas system installations on commercial vehicles.

TABLE U-5

Part	Location	Extent of classified area ¹	Equipment shall be suitable for Class I, Group D ²
A	Storage containers other than DOT cylinders	Within 15 feet in all directions from connections, except connections otherwise covered in this table	Division 2
B	Tank vehicle and tank car loading and unloading ³	Within 5 feet in all directions from connections regularly made or disconnected for product transfer	Division 1
		Beyond 5 feet but within 15 feet in all directions from a point where connections are regularly made or disconnected and within the cylindrical volume between the horizontal equator of the sphere and grade (See Figure H-1)	Division 2
C	Gauge vent openings other than those on DOT cylinders	Within 5 feet in all directions from point of discharge	Division 1
		Beyond 5 feet but within 15 feet in all directions from point of discharge	Division 2
D	Relief valve discharge other than those on DOT cylinders	Within direct path of discharge	Division 1 <i>Note:</i> Fixed electrical equipment should not be installed
		Within 5 feet in all directions from point of discharge	Division 1

Part	Location	Extent of classified area ¹	Equipment shall be suitable for Class I, Group D ²
		Beyond 5 feet but within 15 feet in all directions from point of discharge except within the direct path of discharge	Division 2
E	Pumps, compressors, gas-air mixers and vaporizers other than direct fired	Indoors without ventilation	Division 1 Entire room and any adjacent room not separated by a gastight partition
			Division 2 Within 15 feet of the exterior side of any exterior wall or roof that is not vaportight or within 15 feet of any exterior opening
		Indoors with adequate ventilation ⁴	Division 2 Entire room and any adjacent room not separated by a gastight partition
F	Service station dispensing units	Outdoors in open air at or above grade	Division 2 Within 15 feet in all directions from this equipment and within the cylindrical volume between the horizontal equator of the sphere and grade (See Figure H-1)
			Division 1 Entire space within dispenser enclosure, and 18 inches horizontally from enclosure exterior up to an elevation 4 ft. above dispenser base. Entire pit or open space beneath dispenser
			Division 2 Up to 18 inches above grade within 20 ft. horizontally from any edge of enclosure
			<i>Note:</i> For pits within this area, see Part F of this table
G	Pits or trenches containing or located beneath LP-gas valves, pumps, compressors, regulators, and similar equipment		Division 1 Entire pit or trench
		Without mechanical ventilation	Division 2 Entire room and any adjacent room not separated by a gastight partition
			Division 2 Within 15 feet in all directions from pit or trench when located outdoors

Part	Location	Extent of classified area ¹	Equipment shall be suitable for Class I, Group D ²
	With adequate mechanical ventilation	Entire pit or trench	Division 2
		Entire room and any adjacent room not separated by a gastight partition	Division 2
		Within 15 feet in all directions from pit or trench when located outdoors	Division 2
H	Special buildings or rooms for storage of portable containers	Entire room	Division 2
I	Pipelines and connections containing operational bleeds, drips, vents or drains	Within 5 ft. in all directions from point of discharge	Division 1
		Beyond 5 ft. from point of discharge, same as Part E of this table	
J	Container filling		
	Indoors without ventilation	Entire room	Division 1
	Indoors with adequate ventilation ⁴	Within 5 feet in all directions from connections regularly made or disconnected for product transfer	Division 1
		Beyond 5 feet and entire room	Division 2
	Outdoors in open air	Within 5 feet in all directions from connections regularly made or disconnected for product transfer	Division 1
		Beyond 5 feet but within 15 feet in all directions from a point where connections are regularly made or disconnected and within the cylindrical volume between the horizontal equator of the sphere and grade (See Fig. H-1.)	Division 2



[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-41047, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-41047. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41047, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41049 What requirements apply to liquid-level gauging devices? (1) Each container manufactured after December 31, 1965, and filled on a volumetric basis must have a fixed liquid-level gauge to indicate the maximum permitted filling level according to subsection (5) of this section. Each container manufactured after December 31, 1969, must have permanently attached to the container adjacent to the fixed level gauge a marking showing the percentage full that will be shown by that gauge. When used with a variable liquid-level gauge, the fixed liquid-level gauge will act as a check on the variable gauge. Gauges must be used in charging containers as required in WAC 296-307-41034.

(2) All variable gauging devices must be arranged so that the maximum liquid level for butane, for a 50/50 mixture of butane and propane, and for propane, to which the container may be charged, is easily determined. Liquid levels from empty to full must be marked on the system nameplate or gauging device. Dials of magnetic or rotary gauges must show whether they are for cylindrical or spherical containers and whether for aboveground or underground service. The dials of gauges for aboveground containers of over 1,200 gallons water capacity must be so marked.

(3) Gauging devices that require bleeding of the product to the atmosphere, such as the rotary tube, fixed tube, and slip tube, shall be designed so that the bleed valve maximum opening is not larger than a No. 54 drill size, unless provided with excess flow valve.

(4) Gauging devices must have a design working pressure of at least 250 psig.

(5) Length of tube or position of fixed liquid-level gauge must be designed to indicate the maximum level to which the container may be filled for the product contained. This level shall be based on the volume of the product at 40°F at its maximum permitted filling density for aboveground containers and at 50°F for underground containers. You must calculate the filling point for which the fixed liquid level gauge must be designed according to this section.

¹The classified area must not extend beyond an unpierced wall, roof, or solid vaportight partition.

²See chapter 296-46 WAC, and chapter 296-306A WAC Part T.

³When classifying the extent of a hazardous area, consider the possible variations in the spotting of tank cars and tank vehicles at the unloading points and the effect these variations of actual spotting point may have on the point of connection.

⁴Ventilation, either natural or mechanical, is considered adequate when the concentration of the gas in a gas-air mixture does not exceed twenty-five percent of the lower flammable limit under normal operating conditions.

Note: It is impossible to set out in a table the length of a fixed dip tube for various tank capacities because of the various tank diameters and lengths, and because the tank may be installed either vertically or horizontally. If you know the maximum permitted filling volume in gallons, however, you can determine the length of the fixed tube by using a strapping table from the container manufacturer.

The fixed tube should be long enough so that when its lower end touches the surface of the liquid in the container, the contents of the container will be the maximum permitted volume as determined by the following formula:

$$\frac{\text{Water capacity of container}^1 \text{ (gals.)} \times \text{filling density}^2}{\text{Specific gravity of LP-gas}^1 \times \text{volume correction factor}^3 \times 100} = \text{Maximum volume of LP-gas}$$

¹ Measure at 60°F.

² From WAC 296-307-41037(1).

³ For aboveground containers the liquid temperature is assumed to be 40°F and for underground containers the liquid temperature is assumed to be 50°F. To correct the liquid volumes at these temperatures to 60°F, use the following factors:

(a) To determine maximum volume of LP-gas for which a fixed length of dip tube must be set:

TABLE U-6
VOLUME CORRECTION FACTORS

Specific gravity	Aboveground	Underground
0.500	1.033	1.017
.510	1.031	1.016
.520	1.029	1.015
.530	1.028	1.014
.540	1.026	1.013
.550	1.025	1.013
.560	1.024	1.012
.570	1.023	1.011
.580	1.021	1.011
.590	1.020	1.010

(b) To calculate the maximum volume of LP-gas that can be placed in a container when determining the length of the dip tube expressed as a percentage of total water content of the container, use the formula in (c) of this subsection.

(c) Determine the maximum weight of LP-gas that may be placed in a container for determining the length of a fixed dip tube by multiplying the maximum volume of LP-gas from Table U-6 by the pounds of LP-gas in a gallon at 40°F for aboveground and at 50°F for underground containers. Typical pounds per gallon are specified below:

Example: Assume a one hundred gallon total water capacity tank for aboveground storage of propane having a specific gravity of 0.510 of 60°F.

$$\frac{100 \text{ (gals.)} \times 42 \text{ (filling density)}}{0.510 \times 1.031 \text{ (correction factor from Table U-6)} \times 100} = \frac{4200}{52.6}$$

4200 = 79.8 gallons propane, the maximum amount permitted to be placed in a 100-gallon total water capacity above ground container equipped with a fixed dip tube.

Maximum volume of LP-gas (from formula in (a) of this subsection) x 100

Total water content of container in gallons	Maximum percent of LP-gas	
	Aboveground, pounds per gallon	Underground, pounds per gallon
Propane	4.37	4.31
N Butane	4.97	4.92

(6) Fixed liquid-level gauges used on non-DOT containers must be stamped on the exterior of the gauge with the letters DT followed by the vertical distance (expressed in inches and carried out to one decimal place) from the top of container to the end of the dip tube or to the centerline of the gauge when located at the maximum permitted filling level. For portable containers that may be filled in the horizontal and/or vertical position the letters DT must be followed by V with the vertical distance from the top of the container to the end of the dip tube for vertical filling, and with H followed by the proper distance for horizontal filling. For DOT containers the stamping must be placed both on the exterior of the gauge and on the container. On aboveground or cargo containers where the gauges are positioned at specific levels, the marking may be specified in percent of total tank contents and the marking must be stamped on the container.

(7) Columnar gauge glasses must be restricted to charging plants where the fuel is withdrawn in the liquid phase only. They must have valves with metallic handwheels, excess flow valves, and extra-heavy glass adequately protected with a metal housing applied by the gauge manufacturer. They must be shielded against the direct rays of the sun. Columnar gauge glasses are prohibited on tank trucks, motor fuel tanks, and containers used in domestic, commercial, and industrial installations.

(8) Float gauging devices or equivalent that do not require flow for their operation and that have connections extending outside the container do not have to have excess flow valves if the piping and fittings are adequately designed to withstand the container pressure and are properly protected against physical damage and breakage.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-41049, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-41049, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-41049, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41051 What requirements apply to appliances? (1) New commercial and industrial gas consuming appliances must be approved.

Exception: Any appliance that was originally manufactured for operation with a gaseous fuel other than LP-gas and is in good condition may be used with LP-gas only after it is properly converted, adapted, and tested for performance with LP-gas before the appliance is placed in use.

(2) Unattended heaters used inside buildings for the purpose of animal or poultry production or care must have an approved automatic device designed to shut off the flow of gas to the main burners, and pilot if used, in case the flame goes out.

(3) All commercial, industrial, and agricultural appliances or equipment must be installed according to the requirements of these standards and according to the following:

(a) Domestic and commercial appliances, NFPA 54-1969, Standard for the Installation of Gas Appliances and Gas Piping.

(b) Industrial appliances, NFPA 54A-1969, Standard for the Installation of Gas Piping and Gas Equipment on Industrial Premises and Certain Other Premises.

(c) Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, NFPA 37-1970.

(d) Standard for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment, NFPA 96-1970.

[Recodified as § 296-307-41051. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41051, filed 10/31/96, effective 12/1/96.]

WAC 296-307-415 Cylinder systems.

[Recodified as § 296-307-415. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-415, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41501 What does this section cover?

WAC 296-307-415 applies to systems using DOT containers. Cylinder systems must meet all requirements of WAC 296-307-410 (unless otherwise indicated) and the additional requirements of this section.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-41501, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-41501. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41501, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41503 What is a "cylinder system?" A "cylinder system" includes the container base or bracket, containers, container valves, connectors, manifold valve assembly, regulators, and relief valves.

[Recodified as § 296-307-41503. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41503, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41505 How must containers be marked for cylinder systems? (1) Containers must be marked according to DOT regulations. Additional markings that do not conflict with DOT regulations may be used.

(2) Each container must be marked with its water capacity in pounds or other identified unit of weight.

(3) Exception: If you are the only one who fills and maintains the container and if the water capacity of the container is identified by a code, subsection (2) of this section does not apply.

(4) Each container must be marked with its tare weight in pounds or other identified unit of weight including all permanently attached fittings but not the cap.

[Recodified as § 296-307-41505. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41505, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41507 What additional requirements apply to cylinder systems installed outdoors? (1) Contain-

ers must not be buried below ground. However, systems may be installed in a compartment or recess below grade level, such as a niche in a slope or terrace wall that is used for no other purpose, if the container and regulating equipment are not in contact with the ground, and the compartment or recess is drained and ventilated horizontally to the outside air from its lowest level, with the outlet at least 3 feet away from any building opening below the level of the outlet.

(2) Except as provided in WAC 296-307-41025(14), the discharge from safety-relief devices must be located at least three feet away from any building opening that is below the level of discharge and must not terminate beneath any building unless the space is well ventilated to the outside and is not enclosed on more than two sides.

(3) Containers must be set on firm foundation or otherwise firmly secured; the possible effect of settling on the outlet piping must be guarded against by a flexible connection or special fitting.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-41507, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-41507. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41507, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41509 What additional requirements apply to cylinder system installed indoors? (1) When portable containers are necessary and it is not practical to use them outdoors, containers and equipment may be used indoors only if they meet the requirements of this section.

(a) "Containers in use" means connected for use.

(b) Systems using containers with a water capacity greater than 2-1/2 pounds (nominal one pound LP-gas capacity) must have excess flow valves. Such excess flow valves must be either integral with the container valves or in the connections to the container valve outlets. In either case, an excess flow valve must be installed so that any strain beyond the excess flow valve will not cause breakage between the container and the excess flow valve. The installation of excess flow valves must take into account the type of valve protection provided.

(c) Regulators must be either directly connected to the container valves or to manifolds connected to the container valves. The regulator must be suitable for use with LP-gas. Manifolds and fittings connecting containers to pressure regulator inlets must be designed for at least 250 psig service pressure.

(d) Valves on containers having a water capacity greater than fifty pounds (nominal twenty pounds LP-gas capacity) must be protected while in use.

(e) Aluminum pipe or tubing is prohibited.

(f) Hose must be designed for a working pressure of at least 250 psig. Hose and hose connections shall be listed by a nationally recognized testing laboratory.

(i) Hose must be as short as practical.

(ii) Hose must be long enough to allow required spacing without kinking, straining, or allowing hose to be close enough to a burner to be damaged by heat.

(g) Portable heaters, including salamanders, must have an approved automatic device to shut off the flow of gas to the main burner, and pilot if used, in case the flame goes out. Heaters with inputs above 50,000 Btu manufactured on or

after May 17, 1967, and heaters with inputs above 100,000 Btu manufactured before May 17, 1967, must have either:

- (i) A pilot that must be lighted and proved before the main burner can be turned on; or
- (ii) An electric ignition system;
- (iii) Container valves, connectors, regulators, manifolds, piping, and tubing must not be used as structural supports for heaters.

Exception: These requirements do not apply to tar kettle burners, torches, melting pots, nor do they apply to portable heaters under 7,500 Btu/h input when used with containers with a maximum water capacity of 2-1/2 pounds.

(h) Containers, regulating equipment, manifolds, piping, tubing, and hose must be located to minimize exposure to abnormally high temperatures (such as may result from exposure to convection or radiation from heating equipment or installation in confined spaces), physical damage, or tampering.

(i) Heat producing equipment must be located and used to minimize the possibility of igniting combustibles.

(j) Containers with water capacity greater than 2-1/2 pounds (nominal one pound LP-gas capacity) connected for use, must stand on a firm and substantially level surface and, when necessary, must be secured in an upright position.

(k) Containers, including the valve protective devices, must be installed to minimize the probability of impingement of discharge of safety-relief devices upon containers.

(2) Containers with a maximum water capacity of 2-1/2 pounds (nominal one pound LP-gas capacity) may be used indoors as part of approved self-contained hand torch assemblies or similar appliances.

(3) When buildings frequented by the public are open to the public, containers may be used for repair or minor renovation as follows:

(a) The maximum water capacity of individual containers must be 50 pounds (nominal twenty pounds LP-gas capacity).

(b) The number of LP-gas containers must not exceed the number of employees assigned to use LP-gas.

(c) Containers with a water capacity greater than 2-1/2 pounds (nominal one pound LP-gas capacity) must be attended at all times.

(4) When buildings frequented by the public are closed to the public, containers may be used in buildings or structures for repairs or minor renovation as follows:

(a) The maximum water capacity of individual containers must be 245 pounds (nominal one hundred pounds LP-gas capacity).

(b) For temporary heating such as curing concrete, drying plaster and similar applications, heaters (other than integral heater-container units) must be located at least six feet from any LP-gas container. You may use heaters specifically designed for attachment to the container or to a supporting standard, if they are designed and installed to prevent direct or radiant heat application from the heater onto the container. Blower and radiant type heater must not be directed toward any LP-gas container within 20 feet.

(c) If two or more heater-container units are located in an unpartitioned area on the same floor, the container or contain-

ers of each unit must be separated from the container or containers of any other unit by at least 20 feet.

(d) When heaters are connected to containers for use in an unpartitioned area on the same floor, the total water capacity of containers manifolded together for connection to a heater or heaters shall not be greater than 735 pounds (nominal three hundred pounds LP-gas capacity). Such manifolds must be separated by at least 20 feet.

(e) On floors on which heaters are not connected for use, containers may be manifolded together for connection to a heater or heaters on another floor, if:

(i) The total water capacity of containers connected to any one manifold is a maximum of 2,450 pounds (nominal one thousand pounds LP-gas capacity) and;

(ii) Where more than one manifold having a total water capacity greater than 735 pounds (nominal three hundred pounds LP-gas capacity) are located in the same unpartitioned area, they shall be separated by at least 50 feet.

(f) Containers with a water capacity greater than 2-1/2 pounds (nominal one pound LP-gas capacity) must be attended at all times.

(5) Containers may be used in industrial occupancies for processing, research, or experimental purposes as follows:

(a) The maximum water capacity of individual containers must be 245 pounds (nominal one hundred pounds LP-gas capacity).

(b) Containers connected to a manifold must have a total water capacity of a maximum of 735 pounds (nominal three hundred pounds LP-gas capacity) and only one manifold may be located in the same room unless separated at least 20 feet from a similar unit.

(c) LP-gas in containers for research and experimental use must use the smallest practical quantity.

(6) Containers used in industrial occupancies with essentially noncombustible contents where portable equipment for space heating is essential and where a permanent heating installation is not practical, must meet the requirements of subsection (5) of this section.

(7) Containers may be used in buildings for temporary emergency heating purposes, if necessary to prevent damage to the buildings or contents, when the permanent heating system is temporarily out of service, as follows:

(a) Containers and heaters must meet the requirements of subsection (5) of this section.

(b) The temporary heating equipment must be attended at all times.

(8) Containers may be used temporarily in buildings for training purposes related in installation and use of LP-gas systems, as follows:

(a) The maximum water capacity of individual containers must be 245 pounds (nominal one hundred pounds LP-gas capacity), but the maximum quantity of LP-gas that may be placed in each container is 20 pounds.

(b) If more than one container is located in the same room, the containers must be separated by at least 20 feet.

(c) Containers must be removed from the building when the training class has terminated.

[Recodified as § 296-307-41509. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41509, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41511 What requirements apply to valves and accessories? (1) Valves in the assembly of multiple container systems must be arranged so that containers can be replaced without shutting off the flow of gas in the system.

Note: An automatic changeover device is not required.

(2) Regulators and low-pressure relief devices must be rigidly attached to the cylinder valves, cylinders, supporting standards, the building walls or otherwise rigidly secured and must be installed or protected so that weather will not affect their operation.

(3) Valves and connections to the containers must be protected while in transit, in storage, and while being moved into final use, as follows:

(a) By setting into the recess of the container to prevent the possibility of being struck if the container is dropped on a flat surface; or

(b) By ventilated cap or collar, fastened to the container capable of withstanding a blow from any direction equivalent to that of a 30-pound weight dropped four feet. Construction must ensure that a blow will not be transmitted to the valve or other connection.

(4) When containers are not connected to the system, the outlet valves must be kept tightly closed or plugged, even on empty containers.

(5) Containers having a water capacity in excess of 50 pounds (approximately 21 pounds LP-gas capacity), recharged at the installation, must have excess flow or back-flow check valves to prevent the discharge of container contents in case of failure of the filling or equalizing connection.

[Recodified as § 296-307-41511. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41511, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41513 What requirements apply to safety devices for cylinder systems? (1) Containers must have safety devices as required by DOT regulations.

(2) A final stage regulator of an LP-gas system (excluding any appliance regulator) must have, on the low-pressure side, a relief valve that is set to start to discharge within the limits specified in Table U-7.

TABLE U-7

Relief valve start-to-discharge pressure setting (percent of regulator delivery pressure)

Regulator delivery pressure	Minimum	Maximum
1 psig or less	200	300
Above 1 psig but not over 3 psig	140	200
Above 3 psig	125	200

(3) When a regulator or pressure relief valve is used indoors for other than purposes specified in WAC 296-307-41017(1), the relief valve and the space above the regulator and relief valve diaphragms shall be vented to the outside air with the discharge outlet located at least three feet horizontally away from any building opening that is below such discharge.

Exception: This requirement does not apply to individual appliance regulators when protection is otherwise provided,

nor to WAC 296-307-41509 and 296-307-41025(14). In buildings devoted exclusively to gas distribution, the space above the diaphragm need not be vented to the outside.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-41513, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-41513. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41513, filed 10/31/96, effective 12/1/96.]

WAC 296-307-41515 What other requirements apply to cylinder systems? (1) Containers must not be reinstalled unless they are requalified according to DOT regulations.

(2) A product must not be placed in a container marked with a service pressure less than four-fifths of the maximum vapor pressure of product at 130°F.

[Recodified as § 296-307-41515. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-41515, filed 10/31/96, effective 12/1/96.]

WAC 296-307-420 Systems using non-DOT containers.

[Recodified as § 296-307-420. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-420, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42001 What does this section cover? WAC 296-307-420 applies to systems using storage containers not constructed according to DOT specifications. Non-DOT containers must meet all requirements of WAC 296-307-410 (unless otherwise indicated) and the additional requirements of this section.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-42001, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-42001. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42001, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42003 How must non-DOT containers be designed and classified? Storage containers must be designed and classified according to Table U-8.

TABLE U-8

Minimum design pressures of container lb. per sp. in. gauge

Container type	For gases with vapor press. Not to exceed lb. per sp. in. gauge 100°F (37.8°C.)	1949 and earlier editions of ASME Code (Par. U-68, U-69)	1949 edition of Code (Par. U-200, U-201); 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of ASME Code; All editions of API-ASME Code ³
80 ¹	80 ¹	80 ¹	100 ¹
100	100	100	125
125	125	125	156
150	150	150	187
175	175	175	219
200 ²	215	200	250

¹New type 80 storage containers have not been authorized since Dec. 31, 1947.

²Container type may be increased by increments of 25. The minimum design pressure of containers shall be 100% of the container type designations when constructed under 1949 or earlier editions of the ASME

Code (Par. U-68 and U-69). The minimum design pressure of containers shall be 125% of the container type designation when constructed under:

1. The 1949 ASME Code (Par. U-200 and U-201);
2. 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of the ASME Code; and
3. All editions of the API-ASME Code.

³Construction of containers under the API-ASME Code is prohibited after July 1, 1961.

[Recodified as § 296-307-42003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42005 What requirements apply to valves and accessories, filler pipes, and discharge pipes for non-DOT containers? (1) The filling pipe inlet terminal must not be located inside a building. For containers with a water capacity of 125 gallons or more, such terminals must be located at least 10 feet from any building, and preferably at least 5 feet from any driveway, and must have a protective housing.

(2) The filling connection must be fitted with one of the following:

(a) Combination back-pressure check valve and excess flow valve.

(b) One double or two single back-pressure check valves.

(c) A positive shut-off valve in conjunction with either:

(i) An internal back pressure valve; or

(ii) An internal excess flow valve.

(3) All openings in a container must have approved automatic excess flow valves unless otherwise exempt.

(4) An excess flow valve is not required in the withdrawal service line if the following requirements are met:

(a) The total water capacity is a maximum of 2,000 U.S. gallons.

(b) The discharge from the service outlet is controlled by a manually operated shut-off valve that is:

(i) Threaded directly into the service outlet of the container; or

(ii) Is an integral part of a substantial fitting threaded into or on the service outlet of the container; or

(iii) Threaded directly into a substantial fitting threaded into or on the service outlet of the container.

(c) The shut-off valve is equipped with an attached hand-wheel or the equivalent.

(d) The controlling orifice between the contents of the container and the outlet of the shut-off valve is a maximum of 5/16 inch in diameter for vapor withdrawal systems and 1/8 inch in diameter for liquid withdrawal systems.

(e) An approved pressure-reducing regulator is directly attached to the outlet of the shut-off valve and is rigidly supported, or an approved pressure-reducing regulator is attached to the outlet of the shut-off valve by means of a suitable flexible connection, if the regulator is adequately supported and properly protected on or at the tank.

(5) All inlet and outlet connections except safety-relief valves, liquid-level gauging devices and pressure gauges on containers of 2,000 gallons water capacity, or more, and on any container used to supply fuel directly to an internal combustion engine, must be labeled to designate whether they

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communicate with vapor or liquid space. Labels may be on valves.

(6) Instead of an excess flow valve, openings may be fitted with a quick-closing internal valve that must remain closed when not in operation. The internal mechanism for such valves may have a secondary control that must have a fusible plug (not over 220°F melting point) that will cause the internal valve to close automatically in case of fire.

(7) A maximum of two plugged openings may be used on a container of 2,000 gallons or less water capacity.

(8) Containers of 125 gallons water capacity or more manufactured after July 1, 1961, must have an approved device for liquid evacuation, the size of which must be 3/4 inch national pipe thread minimum. A plugged opening does not satisfy this requirement.

[Recodified as § 296-307-42005. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42007 What additional requirements apply to safety devices for non-DOT containers? (1) All safety devices must comply with the following:

(a) All container safety-relief devices must be located on the containers.

(b) In industrial and gas manufacturing plants, discharge pipe from safety-relief valves on pipe lines within a building must discharge upward and be piped to a point outside a building.

(c) Safety-relief device discharge terminals must be located to provide protection against physical damage and must be fitted with loose raincaps. Return bends and restrictive pipefittings are prohibited.

(d) If desired, discharge lines from two or more safety-relief devices located on the same unit, or similar lines from two or more different units, may be run into a common discharge header, if the cross-sectional area of the header is at least equal to the sum of the cross-sectional area of the individual discharge lines, and the setting of safety-relief valves are the same.

(e) Each storage container of over 2,000 gallons water capacity must have a suitable pressure gauge.

(f) A final stage regulator of an LP-gas system (excluding any appliance regulator) must have, on the low-pressure side, a relief valve that is set to start to discharge within the limits specified in Table U-7.

(g) When a regulator or pressure relief valve is installed indoors, the relief valve and the space above the regulator and relief valve diaphragms must be vented to the outside air with the discharge outlet located not less than 3 feet horizontally away from any opening into the building that is below such discharge.

Exception:

This requirement does not apply to individual appliance regulators already protected. In buildings devoted exclusively to gas distribution, the space above the diaphragm need not be vented to the outside.

(2) Safety devices for aboveground containers must be provided as follows:

(a) Containers of 1,200 gallons water capacity or less that may contain liquid fuel when installed aboveground must have the rate of discharge required by WAC 296-307-

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41025(2) provided by a spring-loaded relief valve or valves. In addition to the required spring-loaded relief valve, a suitable fuse plug may be used if the total discharge area of the fuse plug for each container does not exceed 0.25 square inch.

(b) The fusible metal of the fuse plugs must have a yield temperature of 208°F minimum and 220°F maximum. Relief valves and fuse plugs must have direct communication with the vapor space of the container.

(c) On a container having a water capacity between 125 and 2,000 gallons, the discharge from the safety-relief valves must be vented away from the container upwards and unobstructed to the open air so that it prevents any impingement of escaping gas upon the container; loose-fitting rain caps shall be used. Suitable provision must be made for draining condensate that may accumulate in the relief valve or its discharge pipe.

(d) On containers of 125 gallons water capacity or less, the discharge from safety-relief devices must be located at least 5 feet horizontally away from any opening into the building below the level of such discharge.

(e) On a container having a water capacity greater than 2,000 gallons, the discharge from the safety-relief valves must be vented away from the container upwards to a point at least 7 feet above the container, and unobstructed to the open air so that it prevents any impingement of escaping gas upon the container; loose-fitting rain caps shall be used. Suitable provision must be made so that any liquid or condensate that may accumulate inside of the safety-relief valve or its discharge pipe will not render the valve inoperative. If a drain is used, the container, adjacent containers, piping, or equipment must be protected against impingement of flame resulting from ignition of product escaping from the drain.

(3) On all containers that are installed underground and that contain no liquid fuel until buried and covered, the rate of discharge of the spring-loaded relief valve installed thereon may be reduced to a minimum of 30% of the rate of discharge specified in WAC 296-307-41025(2). Containers so protected must remain covered after installation until the liquid fuel has been removed. Containers that may contain liquid fuel before being installed underground and before being completely covered with earth are aboveground containers when determining the rate of discharge requirement of the relief valves.

(4) On underground containers of over 2,000 gallons water capacity, the discharge from safety-relief devices must be piped directly upward to a point at least 7 feet above the ground.

(5) Where the manhole or housing may become flooded, the discharge from regulator vent lines must be above the highest probable water level. All manholes or housings must have ventilated louvers or equivalent, and the area of openings must be equal to or exceed the combined discharge areas of the safety-relief valves and other vent lines that discharge their content into the manhole housing.

(6) Safety devices for vaporizers must be provided as follows:

(a) Vaporizers of less than 1 quart total capacity, heated by the ground or the surrounding air, need not have safety-

relief valves if adequate tests demonstrate that the assembly is safe without safety-relief valves.

(b) Fusible plugs are prohibited on vaporizers.

(c) In industrial and gas manufacturing plants, safety-relief valves on vaporizers within a building must be piped to a point outside the building and be discharged upward.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-42007, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-42007, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-42007, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42009 When may non-DOT containers be reinstalled? Containers may be reinstalled if they are free from harmful external corrosion or other damage. Where containers are reinstalled underground, the corrosion resistant coating must be put in good condition. Where containers are reinstalled aboveground, the safety devices and gauging devices must meet all requirements for aboveground containers.

[Recodified as § 296-307-42009, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-42009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42011 What is the maximum capacity allowed for non-DOT containers? A non-DOT storage container must have a maximum 90,000 gallons water capacity.

[Recodified as § 296-307-42011, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-42011, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42013 How must non-DOT containers be installed? (1) Containers installed aboveground must have substantial masonry or noncombustible structural supports on firm masonry foundation, unless otherwise indicated.

(2) Aboveground containers must be supported as follows:

(a) Horizontal containers must be mounted on saddles that permit expansion and contraction. Structural metal supports may be used when they are protected against fire. Suitable means of preventing corrosion must be provided on that portion of the container in contact with the foundations or saddles.

(b) Containers of 2,000 gallons water capacity or less may be installed with nonfireproofed ferrous metal supports if mounted on concrete pads or footings, and if the distance from the outside bottom of the container shell to the concrete pad, footing, or the ground is a maximum of 24 inches.

(3) Any container may be installed with nonfireproofed ferrous metal supports if mounted on concrete pads or footings, and if the distance from the outside bottom of the container to the ground is a maximum of 5 feet, if the container is in an isolated location.

(4) Partially buried containers must meet the following requirements:

(a) The portion of the container below the surface and for a vertical distance not less than 3 inches above the surface of the ground is protected to resist corrosion, and the container is protected against settling and corrosion as required for fully buried containers.

(b) Partially buried containers must meet the same spacing requirements as underground tanks.

(c) Relief valve capacity must be the same as for aboveground containers.

(d) Container is protected against vehicular damage by location or other means.

(e) Partially buried containers must meet the same requirements for filling densities as for aboveground containers.

(5) Containers buried underground must be placed so that the top of the container is at least 6 inches below grade. Underground containers subject to abrasive action or physical damage must be:

(a) Placed not less than 2 feet below grade; or

(b) Otherwise protected against such physical damage.

It is not necessary to cover the portion of the container to which manhole and other connections are affixed. When necessary to prevent floating, containers must be securely anchored or weighted.

(6) Containers must be given a protective coating before being placed underground. This coating must be equivalent to hot-dip galvanizing or to two coatings of red lead followed by a heavy coating of coal tar or asphalt. In lowering the container into place, take care to prevent damage to the coating. Any damage to the coating must be repaired before backfilling.

Containers must be set on a firm foundation (firm earth may be used) and surrounded with earth or sand firmly tamped in place. Backfill should be free of rocks or other abrasive materials.

(7) Containers with foundations attached (portable or semiportable containers with suitable steel runners or skids popularly known as "skid tanks") must meet the requirements of WAC 296-307-410 and the following:

(a) If they are to be used at a given general location for a temporary period of 6 months at most, they may be without fire-resisting foundations or saddles but must have adequate ferrous metal supports.

(b) They must not be located with the outside bottom of the container shell more than 5 feet above the surface of the ground unless fire-resisting supports are provided.

(c) The bottom of the skids must be between 2 and 12 inches below the outside bottom of the container shell.

(d) Flanges, nozzles, valves, fittings, and the like, having communication with the interior of the container, must be protected against physical damage.

(e) When not permanently located on fire-resisting foundations, piping connections must be flexible enough to minimize breakage or leakage of connections if the container settles, moves, or is otherwise displaced.

(f) Skids, or lugs for attachment of skids, must be secured to the container according to the rules under which the container is designed and built (with a minimum factor of safety of four) to withstand loading in any direction equal to four times the weight of the container and attachments when filled to the maximum permissible loaded weight.

(8) Field welding where necessary must be made only on saddle plates or brackets that were applied by the manufacturer of the tank.

(9) For aboveground containers, secure anchorage or adequate pier height must be provided against possible container flotation wherever high floodwater might occur.

(10) When permanently installed containers are interconnected, you must allow for expansion, contraction, vibration, and settling of containers, and interconnecting piping. Where flexible connections are used, they must be approved and designed for a bursting pressure of at least five times the vapor pressure of the product at 100°F. Nonmetallic hose is prohibited for permanently interconnecting containers.

(11) Container assemblies listed for interchangeable installation aboveground or underground must meet the requirements for aboveground installations for safety-relief capacity and filling density. For installation aboveground all other requirements for aboveground installations apply. For installation underground all other requirements for underground installations apply.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-42013, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-42013, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-42013, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42015 How must non-DOT containers be protected? (1) Valves, regulating, gauging, and other container accessory equipment must be protected against tampering and physical damage. Such accessories must also be protected during the transit of containers intended for installation underground.

(2) On underground or combination aboveground-underground containers, the service valve handwheel, the terminal for connecting the hose, and the opening through which there can be a flow from safety-relief valves must be at least 4 inches above the container and this opening must be located in the dome or housing. Underground systems must be installed so that all openings, including the regulator vent, are located above the normal maximum water table.

(3) All connections to the underground containers must be located within a substantial dome, housing, or manhole, with access protected by a substantial cover.

[Recodified as § 296-307-42015, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-42015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42017 What requirements apply to non-DOT containers in industrial plants? General provisions applicable to systems in industrial plants (of 2,000 gallons water capacity and more) and to bulk filling plants.

(1) When standard watch service is provided, it must be extended to the LP-gas installation and personnel shall be properly trained.

(2) If loading and unloading are normally done during the night, adequate lights must be provided to illuminate storage containers, control valves, and other equipment.

(3) Suitable roadways or means of access for extinguishing equipment such as wheeled extinguishers or fire department apparatus must be provided.

(4) To minimize trespassing or tampering, the area that includes container accessories, pumping equipment, loading and unloading facilities, and cylinder-filling facilities must be enclosed with at least a 6-foot-high industrial fence unless

otherwise adequately protected. There must be at least two means of emergency access.

[Recodified as § 296-307-42017, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42017, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42019 What requirements apply to container-charging plants? (1) The container-charging room must be located at least:

- (a) Ten feet from bulk storage containers.
- (b) Twenty-five feet from line of adjoining property that may be built on.
- (2) Tank truck filling station outlets must be located at least:
 - (a) Twenty-five feet from line of adjoining property that may be built on.
 - (b) Ten feet from pumps and compressors if housed in one or more separate buildings.
 - (3) The pumps or compressors may be located in the container-charging room or building, in a separate building, or outside of buildings. When housed in separate building, such building (a small noncombustible weather cover is not to be construed as a building) must be located at least:

- (a) Ten feet from bulk storage tanks.
- (b) Twenty-five feet from line of adjoining property that may be built on.
- (c) Twenty-five feet from sources of ignition.
- (4) When a part of the container-charging building is to be used for a boiler room or where open flames or similar sources of ignition exist or are employed, the space to be occupied must be separated from container charging room by a partition wall or walls of fire-resistant construction continuous from floor to roof or ceiling. Such separation walls must be without openings and must be joined to the floor, other walls, and ceiling or roof to provide a permanent gas-tight joint.

[Recodified as § 296-307-42019, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42019, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42021 What fire protection must be provided for non-DOT containers? (1) Each bulk plant must have at least one approved portable fire extinguisher with a minimum rating of 12-B, C.

(2) In industrial installations involving containers of 150,000 gallons aggregate water capacity or more, you must provide an adequate supply of water at the container site for fire protection in the container area, unless other adequate means for fire control are provided. Water hydrants must be readily accessible and spaced to provide water protection for all containers. Enough firehose must be provided to facilitate easy movement of the hose in the container area. You should equip the outlet of each hose line with a combination fog nozzle. A shelter must be provided to protect the hose and its conveyor from the weather.

[Recodified as § 296-307-42021, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42021, filed 10/31/96, effective 12/1/96.]

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WAC 296-307-42023 What other requirements apply to non-DOT containers? (1) Aboveground containers must be kept properly painted.

(2) Vaporizers for internal combustion engines must meet the requirements of WAC 296-307-42515.

(3) Gas regulating and mixing equipment for internal combustion engines must meet the requirements of WAC 296-307-42517.

(4) Where vaporized gas on the low-pressure side of the system may condense to a liquid at normal operating temperatures and pressures, means must be provided to revaporize condensate.

(5) You must protect LP-gas systems against damage from vehicular traffic.

(6) Avoid the use of pits when possible, except pits fitted with automatic flammable vapor detecting devices. No drains or blowoff lines must be directed into or in proximity to sewer systems used for other purposes.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-42023, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-42023, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42023, filed 10/31/96, effective 12/1/96.]

WAC 296-307-425 LP-gas as a motor fuel.

[Recodified as § 296-307-425, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-425, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42501 What does this section cover?

(1) WAC 296-307-425 applies to internal combustion engines, fuel containers, and pertinent equipment for the use of LP-gases as a motor fuel on easily movable, readily portable units including self-propelled vehicles. This section does not apply to containers for transportation of LP-gases nor to marine fuel use.

(2) All uses of LP-gas as a motor fuel must meet all requirements of WAC 296-307-410 (unless otherwise indicated) and the additional requirements of this section.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-42501, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-42501, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42501, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42503 What general requirements apply to LP-gas used as a motor fuel? (1) Fuel may be used from the cargo tank of a truck while in transit, but not from cargo tanks on trailers or semitrailers. Fuel may be used from the cargo tanks to operate stationary engines if the wheels are securely blocked.

(2) Passenger-carrying vehicles must not be fueled while passengers are on board.

(3) Industrial trucks (including lift trucks) equipped with permanently mounted fuel containers must be charged outdoors. Charging equipment must meet the requirements of WAC 296-307-440.

(4) LP-gas fueled industrial trucks must comply with the Standard for Type Designations, Areas of Use, Maintenance and Operation of Powered Industrial Trucks, NFPA 505-1969.

(5) Engines on vehicles must be shut down while fueling if the fueling operation involves venting to the atmosphere.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-42503, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-42503, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-42503, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42505 How must fuel containers be designed and classified? (1) Containers must meet the following requirements:

Minimum design pressure of container lb. per sp. in. gauge

Container type	For gases with vapor press. Not to exceed lb. per sp. in. gauge at 100°F (37.8°C.)	1949 and earlier editions of ASME Code (Par. U-68, U-69)	1949 edition of ASME Code(Par. U-200, U-201); editions 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of ASME Code; All editions of API-ASME Code ²
200 ¹	215	200	250

¹Container type may be increased by increments of 25. The minimum design pressure of containers shall be 100% of the container type designation when constructed under 1949 or earlier editions of the ASME Code (Par. U-68 and U-69). The minimum design pressure of containers shall be 125% of the container type designation when constructed under:

1. The 1949 ASME Code (Par. U-200 and U-201);
2. 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of the ASME Code; and
3. All editions of the API-ASME Code.

²Construction of containers under the API-ASME Code is prohibited after July 1, 1961

Exception: Fuel containers for use in industrial trucks (including lift trucks) shall be either DOT containers authorized for LP-gas service having a minimum service pressure of 240 psig or minimum Container Type 250. Under 1950 and later ASME Codes, this means a 312.5-psig design pressure container.

(2) DOT containers used as fuel containers must meet all requirements of this section.

(3) All container inlets and outlets except safety-relief valves and gauging devices must be labeled to designate whether they communicate with vapor or liquid space. (Labels may be on valves.)

[Recodified as § 296-307-42505, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-42505, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42507 How must fuel containers be installed? (1) Containers must be located to minimize the possibility of damage to the container. Containers located in the rear of trucks and buses, when protected by substantial bumpers meet this requirement. Fuel containers on passenger-carrying vehicles must be installed as far from the engine as is practical, and the passenger space and any space containing radio equipment must be sealed from the container space to prevent direct seepage of gas to these spaces. The container compartment must be vented to the outside. In case the fuel container is mounted near the engine or the exhaust

system, the container must be shielded against direct heat radiation.

(2) Containers must be installed with as much clearance as practical and at least the minimum road clearance of the vehicle under maximum spring deflection. This minimum clearance must be to the bottom of the container or to the lowest fitting on the container or housing, whichever is lower.

(3) Permanent and removable fuel containers must be securely mounted to prevent jarring loose, slipping, or rotating, and the fastenings must be designed and constructed to withstand static loading in any direction equal to twice the weight of the tank and attachments when filled with fuel using a safety factor of at least four based on the ultimate strength of the material to be used. Field welding, when necessary, must be made only on saddle plates, lugs or brackets, attached to the container by the manufacturer.

(4) Fuel containers on buses must be permanently installed.

(5) Containers from which only vapor is to be withdrawn must be installed and equipped with suitable connections to minimize the accidental withdrawal of liquid.

[Recodified as § 296-307-42507, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-42507, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42509 What requirements apply to valves and accessories? (1) Container valves and accessories must have a rated working pressure of at least 250 psig, and must be suitable for LP-gas service.

(2) The filling connection must be fitted with an approved double back-pressure check valve, or a positive shut off in conjunction with an internal back-pressure check valve. On a removable container the filler valve may be a hand operated shut-off valve with an internal excess flow valve. Main shut-off valves on the container on liquid and vapor must be readily accessible.

(3) Filling connections equipped with approved automatic back-pressure check valves, and safety-relief valves, all connections to the containers having openings for the flow of gas in excess of a No. 54 drill size must have approved automatic excess flow valves to prevent discharge of content in case connections are broken.

(4) Liquid-level gauging devices must meet the following requirements:

(a) Variable liquid-level gauges that require the venting of fuel to the atmosphere are prohibited on fuel containers of industrial trucks (including lift trucks).

(b) On portable containers that may be filled in the vertical and/or horizontal position, the fixed liquid-level gauge must indicate maximum permitted filling level for both vertical and horizontal filling with the container oriented to place the safety-relief valve in communication with the vapor space.

(c) For containers used solely in farm tractor service and charged at a point at least 50 feet from any important building, the fixed liquid-level gauging device may be constructed so that the outward flow of container content exceeds that passed by a No. 54 drill size opening, but must never exceed that passed by a No. 31 drill-size opening. An excess flow valve is not required. Fittings equipped with restricted drill

size opening and the container on which they are used must be marked to indicate the size of the opening.

(d) All valves and connections on containers must be adequately protected to prevent damage due to accidental contact with stationary objects or from loose objects thrown up from the road. All valves must be safeguarded against damage due to collision, overturning or other accident. Farm tractors where parts of the vehicle provide protection to valves and fittings meet this requirement. However, on removable type containers the protection for the fittings must be permanently attached to the container.

(e) You should normally exchange removable fuel outdoors. When removable fuel containers are used, means shall be provided in the fuel system to minimize the escape of fuel when the containers are exchanged. You must use one of the following methods:

(i) Using an approved automatic quick-closing coupling (a type closing in both directions when uncoupled) in the fuel line; or

(ii) Closing the valve at the fuel container and allowing the engine to run until the fuel in the line is consumed.

[Recodified as § 296-307-42509. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42509, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42511 What requirements apply to piping, tubing, and fittings? (1) Pipe from fuel container to first-stage regulator must be at least schedule 80 wrought iron or steel (black or galvanized), brass or copper; or seamless copper, brass, or steel tubing. Steel tubing must have a minimum wall thickness of 0.049 inch. Steel pipe or tubing must be adequately protected against exterior corrosion. Copper tubing must be types K or L or equivalent with a minimum wall thickness of 0.032 inch. Approved flexible connections may be used between container and regulator or between regulator and gas-air mixer. Using aluminum pipe or tubing is prohibited. For removable containers, an approved flexible connection must be used between the container and the fuel line.

(2) All piping must be installed, braced, and supported to minimize vibration strains or wear.

[Recodified as § 296-307-42511. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42511, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42513 What requirements apply to safety devices? (1) Spring-loaded internal safety-relief valves must be used on all motor fuel containers.

(2) The discharge outlet from safety-relief valves must be located on the outside of enclosed spaces and as far as practical from possible sources of ignition, and vented upward within 45 degrees of the vertical to prevent impingement of escaping gas upon containers, or parts of vehicles, or on vehicles in adjacent lines of traffic. A rain cap or other protector must be used to keep water and dirt from collecting in the valve.

(3) When a discharge line from the container safety-relief valve is used, the line shall be metallic, other than aluminum, and must be sized, located, and maintained so as not to restrict the required flow of gas from the safety-relief valve. The discharge line must be able to withstand the pres-

sure resulting from the discharge of vapor when the safety-relief valve is in the full open position. Flexible metal hose or tubing must be used when necessary.

(4) Portable containers equipped for volumetric filling may be filled in either the vertical or horizontal position only when oriented to place the safety-relief valve in communication with the vapor space.

[Recodified as § 296-307-42513. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42513, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42515 What requirements apply to vaporizers? (1) Vaporizers, their parts, and other devices that may be subjected to container pressure must have a design pressure of at least 250 psig.

(2) Each vaporizer must have a valve or suitable plug that will permit substantially complete draining of the vaporizer. It must be located at or near the lowest portion of the section occupied by the water or other heating medium.

(3) Vaporizers must be securely fastened to minimize the possibility of loosening.

(4) Each vaporizer must be permanently marked at a visible point as follows:

(a) With the design pressure of the fuel-containing portion in psig.

(b) With the water capacity of the fuel-containing portion of the vaporizer in pounds.

(5) Devices to supply heat directly to a fuel container must have an automatic device to cut off the supply of heat before the pressure inside the fuel container reaches 80% of the start-to-discharge pressure setting of the safety-relief device on the fuel container.

(6) Engine exhaust gases may be used as a direct source of heat supply for the vaporization of fuel if the materials of construction of those parts of the vaporizer in contact with exhaust gases are resistant to the corrosive action of exhaust gases and the vaporizer system is designed to prevent excessive pressures.

(7) Fusible plugs are prohibited on vaporizers.

[Recodified as § 296-307-42515. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42515, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42517 What requirements apply to gas regulating and mixing equipment? (1) Approved automatic pressure reducing equipment must be installed securely between the fuel supply container and gas-air mixer to reduce the pressure of the fuel delivered to the gas-air mixer.

(2) An approved automatic shut-off valve must be provided in the fuel system at some point ahead of the inlet of the gas-air mixer, designed to prevent flow of fuel to the mixer when the ignition is off and the engine is not running. For industrial trucks and engines operating in buildings other than those used exclusively to house engines, the automatic shut-off valve must be designed to operate if the engine stops. Atmospheric regulators (zero governors) are adequate as an automatic shut-off valve only in cases of outdoor operation such as farm tractors, construction equipment, irrigation pump engines, and other outdoor stationary engine installations.

(3) The source of air for combustion must be completely isolated from the passenger compartment, ventilating system, or air-conditioning system.

[Recodified as § 296-307-42517, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42517, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42519 What is the maximum container capacity allowed? A single fuel container used on passenger carrying vehicles must have a maximum of 200 gallons water capacity. A single fuel container on other vehicles normally operating on the highway must have a maximum of 300 gallons water capacity except as provided in WAC 296-307-42503(1).

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-42519, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-42519, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42519, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42521 What requirements apply to stationary engines used indoors? Stationary engines and gas turbines installed in buildings, including portable engines used instead of or to supplement stationary engines, must comply with the Standard for the Institution and Use of Stationary Combustion Engines and Gas Turbines, NFPA 37-1970, and the appropriate requirements of WAC 296-307-410 through 296-307-420.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-42521, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-42521, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42521, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42523 What requirements apply to portable engines used indoors? (1) Portable engines may be used in buildings only for emergency use, and according to WAC 296-307-42521.

(2) Exhaust gases must be discharged outside the building or to an area where they will not constitute a hazard.

(3) Provision must be made to supply sufficient air for combustion and cooling.

(4) An approved automatic shut-off valve must be provided in the fuel system ahead of the engine, designed to prevent flow of fuel to the engine when the ignition is off or if the engine should stop.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-42523, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-42523, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42523, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42525 What requirements apply to industrial trucks used indoors? (1) LP-gas-fueled industrial trucks may be used in buildings and structures.

(2) No more than two LP-gas containers must be used on an industrial truck for motor fuel purposes.

(3) LP-gas-fueled industrial trucks may be used in buildings frequented by the public, when occupied by the public. The total water capacity of containers on each industrial truck must be a maximum of 105 pounds (nominal 45 pounds LP-gas).

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(4) Trucks must be attended at all times in areas occupied by the public.

(5) Industrial trucks must not be parked and left unattended in areas of possible excessive heat or sources of ignition.

[Recodified as § 296-307-42525, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42525, filed 10/31/96, effective 12/1/96.]

WAC 296-307-42527 How must LP-gas-fueled vehicles be garaged? (1) LP-gas-fueled vehicles may be stored or serviced inside garages if there are no leaks in the fuel system and the fuel tanks are not filled beyond the maximum filling capacity allowed.

(2) LP-gas-fueled vehicles being repaired in garages must have the container shut-off valve closed except when fuel is required for engine operation.

(3) Such vehicles must not be parked near sources of heat, open flames, or similar sources of ignition or near open pits unless such pits are adequately ventilated.

[Recodified as § 296-307-42527, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-42527, filed 10/31/96, effective 12/1/96.]

WAC 296-307-430 Storage of containers awaiting use or resale.

[Recodified as § 296-307-430, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-430, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43001 What does this section cover? WAC 296-307-430 applies to the storage of portable containers a maximum of 1,000 pounds water capacity, filled or partially filled, at user location but not connected for use, or in storage for resale by dealers or resellers. This section does not apply to containers stored at charging plants or at plants devoted primarily to the storage and distribution of LP-gas or other petroleum products.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-43001, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-43001, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43001, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43003 What general requirements apply to storage of containers? (1) Containers in storage must be located to minimize exposure to excessive temperature rise, physical damage, or tampering.

(2) Containers stored inside must be located away from exits, stairways, or in areas normally used or intended for the safe exit of people.

(3) Container valves must be protected while in storage as follows:

(a) By setting into recess of container to prevent the possibility of their being struck if the container is dropped upon a flat surface; or

(b) By ventilated cap or collar, fastened to container capable of withstanding blow from any direction equivalent to that of a thirty-pound weight dropped four feet. Construction must be such that a blow will not be transmitted to a valve or other connection.

[Title 296 WAC—p. 2629]

(4) The outlet valves of containers in storage must be closed.

(5) Empty containers that have been in LP-gas service should preferably be stored in the open. When stored inside, they must be considered full containers for the purpose of determining the maximum quantity of LP-gas permitted by this section.

[Recodified as § 296-307-43003, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43005 How must containers be stored within buildings frequented by the public? DOT containers with a maximum individual water capacity of 2-1/2 pounds, used with completely self-contained hand torches and similar applications, may be stored or displayed in a building frequented by the public. The display of such containers must be limited to a total of 24 units of each brand and size. The total quantity on display and in storage must not exceed 200 pounds LP-gas.

[Recodified as § 296-307-43005, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43007 How must containers be stored in buildings not frequented by the public? (1) The quantity of LP-gas stored must be a maximum of 300 pounds (approximately 2,550 cubic feet in vapor form), except when stored within special buildings or rooms.

(2) Containers carried as a part of service equipment on highway mobile vehicles are not considered in the total storage capacity if the vehicles are stored in private garages, and are limited to one container per vehicle with a maximum LP-gas capacity of 100 pounds. All container valves must be closed.

[Recodified as § 296-307-43007, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43007, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43009 How must containers be stored within special buildings or rooms? (1) The quantity of LP-gas stored in special buildings or rooms must be a maximum of 10,000 pounds.

(2) The walls, floors, and ceilings of container storage rooms that are within or adjacent to other parts of the building must be constructed of material having at least a two-hour fire resistance rating.

(3) At least 10% of the exterior walls or roof must be of explosion relieving construction.

(4) Each opening from storage rooms to other parts of the building must be protected by a listed one and one-half hour "(B)" fire door.

(5) Such rooms must have no open flames for heating or lighting.

(6) Such rooms must be adequately ventilated both top and bottom to the outside only. The openings from such vents must be at least five feet away from any other opening into any building.

(7) The floors of such rooms must not be below ground level. Any space below the floor must be of solid fill or properly ventilated to the open air.

[Title 296 WAC—p. 2630]

(8) Such storage rooms must not be located adjoining the line of property occupied by schools, churches, hospitals, athletic fields or other points of public gathering.

[Recodified as § 296-307-43009, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43011 How must containers be stored outdoors? (1) Storage outside of buildings, for containers awaiting use or resale, must be located according to the table below with respect to:

- (a) The nearest important building or group of buildings;
- (b) The line of adjoining property that may be built on;
- (c) Busy thoroughfares;
- (d) The line of adjoining property occupied by schools, churches, hospitals, athletic fields, or other points of public gathering.

Quantity of LP-Gas Stored	Distance
500 pounds or less	0
501 to 2,500 pounds	0*
2,501 to 6,000 pounds	10 feet
6,001 to 10,000 pounds	20 feet
Over 10,000 pounds	25 feet

*Containers must be at least ten feet from any building on adjoining property, any sidewalk, or any of the exposures described in (c) or (d) of this subsection.

(2) Containers must be in a suitable enclosure or otherwise protected against tampering.

[Recodified as § 296-307-43011, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43011, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43013 What fire protection must be provided for stored containers? Storage locations other than supply depots separated and located apart from dealer, reseller, or user establishments must have at least one approved portable fire extinguisher having a minimum rating of 8-B, C.

[Recodified as § 296-307-43013, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43013, filed 10/31/96, effective 12/1/96.]

WAC 296-307-435 LP-gas system installations on commercial vehicles.

[Recodified as § 296-307-435, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-435, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43501 What does this section cover? (1) WAC 296-307-435 applies to:

- (a) LP-gas system installations on vehicles (self-propelled, trailers, or semitrailers) used for commercial or construction purposes;
- (b) All exchangeable container systems with container capacities greater than 105 pounds water capacity (approximately 45 pounds LP-gas capacity); and
- (c) Systems using containers permanently mounted on vehicles.

(2) All LP-gas installations on commercial vehicles must meet all requirements of WAC 296-307-410 (unless other-

wise indicated) and the additional requirements of this section. When such a vehicle is permanently parked, and LP-gas is supplied from a system not mounted on and secured to the unit, WAC 296-307-415 and 296-307-420 also apply.

(3) This section does not apply to LP-gas motor fuel systems covered by WAC 296-307-425.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-43501, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-43501, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-43501, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43503 How must containers be constructed? Containers must be constructed according to WAC 296-307-41011, and marked according to the applicable requirements of WAC 296-307-41015, and must also meet the following:

(1) Containers designed for use as portable cylinders must be constructed according to DOT specifications.

(2) All other containers whether designed for permanent mounting, or for portable or semiportable use (such as skid tanks), must be constructed as provided for by WAC 296-307-41009(4) and 296-307-41011(1).

(3) Nonrecessed container fittings and accessories must be protected against damage by either:

(a) Their location;

(b) The vehicle frame or bumper; or

(c) Protective housing. The housing must meet the requirements under which the tanks are fabricated with respect to design and construction and must be designed to withstand static loading in any direction equal to twice the weight of the tank and attachments when filled with the lading at a safety factor of at least four, based on the ultimate strength of the material used. The housing must have a weather cover if necessary to ensure proper operation of valves and safety devices.

(4) Manually operated shut-off valves or self-closing internal valves must be closed except during transfer operations.

(5) Permanently installed containers must meet the following requirements:

(a) Tank motor vehicles with frames not made integral with the tank, as by welding, must have turnbuckles or similar positive devices for drawing the tank down tight on the frame. In addition, suitable stops or anchors must be attached to the frame and/or the tank to prevent relative motion between them from starting, stopping, and turning. The stops and anchors must be installed to be accessible for inspection and maintenance.

(b) Any tank motor vehicle designed and constructed so that the cargo tank constitutes the stress member used instead of a frame must be supported by external cradles enclosing at least 120 degrees of the shell circumference. The design calculations must include beam stress, shear stress, torsion stress, bending moment, and acceleration stress for the cargo tank as a whole using a factor of safety of four, based on the ultimate tensile strength of the material. Maximum concentrated stresses that might be created at pads and cradles due to shear, bending, and torsion shall also be calculated according to Appendix G of the American Society of Mechanical Engineers, Unfired Pressure Vessel Code, 1968. Fully loaded

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vehicles must be assumed to be operating under highway conditions equal to two "g" loading. The effects of fatigue shall be taken into consideration. Cargo tanks mounted on frames may be supported by upright supports attached to pads if these factors are taken into account.

(c) Where any tank support is attached to any part of a tank head, the stresses imposed upon the head must be provided for as required above.

(d) Tank supports, stops, anchors, and bumpers must not be welded directly to the tank but must be attached by means of pads of the same material as the tank. The pad thickness must be at least 1/4 inch, or the thickness of the shell material if less, and no greater than the shell material. Each pad must extend at least four times its thickness, in each direction, beyond the weld attaching the support, bumper, stop, or anchor. Each pad must be preformed to an inside radius no greater than the outside radius of the tank at the place of attachment. Each pad corner must be rounded to a radius at least one-fourth the width of the pad, and no greater than one-half the width of the pad. Weepholes and tell-tale holes, if used, must be drilled or punched before the pads are attached to the tank. Each pad must be attached to the tank by continuous fillet welding using filler material having properties that meet the recommendations of the maker of the shell and head material.

(6) Portable or semiportable containers must meet the applicable requirements of WAC 296-307-42507(3). Containers designed for permanent installation as part of systems under WAC 296-307-420 are prohibited.

(a) Filling connections must have an approved automatic back pressure check valve, excess flow check valve, or quick closing internal valve to prevent excessive escape of gas in case the filling connection is broken.

Exception: Where the filling and discharge connect on a common opening in the container shell, and the opening is fitted with a quick-closing internal valve, the automatic valve is not required.

Every inlet and outlet connection must have a manually or automatically operated shut-off valve. Liquid discharge openings, except those for engine fuel lines, on tanks built after September 1, 1965, must be fitted with a remotely controlled internal shut-off valve. Valves must meet the following requirements:

(i) The seat of the valve must be inside the tank, or in the opening nozzle or flange, or in a companion flange bolted to the nozzle or flange.

(ii) All parts of the valve inside the tank, nozzle, or companion flange must be made of material that protects against corrosion or other deterioration in the presence of the lading.

(iii) The parts must be arranged so that damage to parts exterior to the tank will not prevent effective seating of the valve.

(iv) The valve may be operated mechanically, by hydraulically, or by air, or gas pressure.

(v) The valve must have remote means of automatic closure, both mechanical and thermal, in at least two places for tanks over 3,500 gallons water capacity. These remote control stations must be located at each end of the tank and diagonally opposite. The thermal control mechanism must have a fusible element with a melting point between 220°F and

208°F. At least one remote control station must be provided for tanks of 3,500 gallons water capacity or less, and such actuating means may be mechanical.

(b) All other connections to containers, except those used for gauging devices, thermometer wells, safety-relief devices, and plugged openings, must have suitable automatic excess flow valves, or may instead be fitted with quick-closing internal valves.

The control mechanism for the internal valve must have a secondary control, remote from the fill or discharge connections (for use in the event of accidents or fire during delivery operations), and such control mechanism must have a fusible element with a melting point not over 220°F or less than 208°F.

(c) Excess flow valves must close automatically at the rated flow of vapor or liquid as specified by the valve manufacturers. The flow rating of the piping beyond the excess flow valve must be greater than that of the excess flow valve and such rating must include valves, fittings, and hose.

Exception: When branching or necessary restrictions are incorporated in a piping system so that flow ratings are less than that of the excess flow valve and the tank, then additional excess flow valves must be installed in the piping where such flow rate is reduced.

(d) Container inlets and outlets, except those used for safety-relief valves, liquid-level gauging devices, and pressure gauges, must be labeled to designate whether they communicate with vapor or liquid space when the container is filled to maximum permitted filling density. Labels may be on the valves.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-43503, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-43503, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-43503, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43505 What is the maximum capacity allowed for LP-gas installations on commercial vehicles? A single fuel container used on passenger carrying vehicles must not exceed 200 gallons water capacity.

[Recodified as § 296-307-43505, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-43505, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43507 Where must systems be located? (1) Containers must not be installed, transported, or stored (even temporarily) inside any vehicle covered by these standards except as provided by the DOT regulations.

(2) Containers, control valves, and regulating equipment comprising a complete system must be suitably protected against damage and weather. Systems may be installed in a recess vaportight to the inside of the vehicle and accessible from and vented to the outside.

(3) Systems installed outside of mobile units must be located so that discharge from safety-relief devices must be at least 3 feet horizontally away from any opening into the unit below the level of such discharge. When the system is located in a recess vaportight to the inside, vent openings in the recess must be at least 3 feet horizontally away from any opening into the mobile unit below the level of these vents.

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(4) There must be no fuel connection between tractor and trailer or other vehicle units.

(5) The container or container carrier must be secured in place by fastenings designed and constructed with a minimum safety factor of four to withstand loading in any direction equal to twice the weight of the container when filled to normal capacity with LP-gas.

[Recodified as § 296-307-43507, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-43507, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43509 What requirements apply to valves and accessories? Container valves and accessories must be provided, protected and mounted as follows:

(1) Systems using DOT cylinders according to WAC 296-307-41511.

(2) All other systems according to WAC 296-307-42005 (2) through (8).

(3) Portable, semiportable and permanently mounted containers shall be mounted and protected as provided under WAC 296-307-43503 (2), (5), and (6).

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-43509, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-43509, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-43509, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43511 What requirements apply to safety devices? (1) DOT containers must have safety-relief devices as required by DOT regulations.

(2) A final stage regulator of an LP-gas system (excluding any appliance regulator) must have, on the low-pressure side, a relief valve that is set to start to discharge within the limits specified in Table U-7.

(3) The relief valve and space above the regulator and relief valve diaphragms must be vented to the outside air and terminate at a position to minimize the possibility of vapors accumulating at sources of ignition.

(4) Whenever equipment such as a cargo heater or cooler on commercial vehicles is designed to be in operation while in transit, suitable means to stop the flow such as an excess flow valve or other device, must be installed. This device will be actuated to stop the flow in the event of the break in the fuel supply line. All excess flow valves must comply with WAC 296-307-41019(3).

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-43511, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-43511, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-43511, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43513 What types of systems may be used on commercial vehicles? Commercial vehicles must use either vapor withdrawal or liquid withdrawal systems.

[Recodified as § 296-307-43513, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-43513, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43515 What requirements apply to enclosures and mounting? (1) Housing or enclosures must be designed to provide proper ventilation.

(2) Hoods, domes, or removable portions of cabinets must have means to keep them firmly in place during transit.

(3) The assembly must hold the containers firmly in position and prevent their movement during transit according to WAC 296-307-42507(3).

(4) Containers must be mounted on a substantial support or base secured firmly to the vehicle chassis. Neither the container nor its support must extend below the frame.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-43515, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-43515, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-43515, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43517 What requirements apply to piping, tubing, and fittings? (1) Regulators must be connected directly to the container valve outlet or mounted securely by means of support bracket and connected to the container valve or valves with a listed high pressure flexible connector.

(2) Provision must be made between the regulator outlet and the gas service lines by either a flexible connector or a tubing loop to provide for expansion, contraction, jarring, and vibration.

(3) Aluminum alloy piping is prohibited. Steel tubing must have a minimum wall thickness of 0.049 inch. Steel piping or tubing must be adequately protected against exterior corrosion.

(4) Approved gas tubing fittings must be used for tubing connections.

(5) The fuel line must be firmly fastened in a protected location and where under the vehicle and outside and below any insulation or false bottom, fastenings must prevent abrasion or damage to the gas line due to vibration. Where the fuel line passes through structural members or floors, a rubber grommet or equivalent must be installed to prevent chafing.

(6) The fuel line must be installed to enter the vehicle through the floor directly beneath or adjacent to the appliance that it serves. When a branch line is required, the tee connection must be in the main fuel line and located under the floor and outside the vehicle.

(7) All parts of the system assembly must be designed and secured to preclude such parts working loose during transit.

[Recodified as § 296-307-43517, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-43517, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43519 What requirements apply to appliances? (1) LP-gas appliances must be approved for use on commercial vehicles.

(2) In vehicles not intended for human occupancy, where the gas-fired heating appliance is used to protect the cargo, such heater may be unvented, but provision must be made to dispose of the products of combustion to the outside.

(3) In vehicles intended for human occupancy, all gas-fired heating appliances, including water heaters, must be designed or installed to provide for complete separation of the combustion system from the atmosphere of the living space. Such appliances must be installed with the combustion

air inlet assembly furnished as a component of the appliance, and with either:

(a) The flue gas outlet assembly furnished as a component of the appliance; or

(b) A listed roof jack if the appliance is listed for such use.

The combustion air inlet assembly, flue gas outlet assembly, and roof jack must extend to the outside atmosphere.

(4) Provision must be made to ensure an adequate supply of outside air for combustion.

(5) All gas-fired heating appliances and water heaters must have an approved automatic device designed to shut off the flow of gas to the main burner and to the pilot in the event the pilot flame is extinguished.

(6) Gas-fired appliances installed in the cargo space must be readily accessible.

(7) Appliances must be constructed or protected to minimize the possible damage or impaired operation resulting from cargo shifting or handling.

(8) Appliances inside the vehicle must be located so that a fire at an appliance will not block the exit route.

[Recodified as § 296-307-43519, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-43519, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43521 What general precautions must be followed for LP-gas system installations on commercial vehicles? (1) DOT containers must be marked, maintained, and requalified for use according to DOT regulations.

(2) Containers that have not been requalified according to DOT regulations must be removed from service. Requalified containers must be stamped with the date of requalification. When DOT cylinders are requalified by retesting, the retest must be made according to DOT regulations.

(3) Containers must not be charged with fuel unless they bear the proper markings of the code under which they were constructed, and with their water capacity. In the case of cylinders or portable containers filled by weight, the container must be marked with its tareweight.

(4) DOT containers that have been involved in a fire must not be recharged until they have been requalified for service according to DOT regulations.

(5) API-ASME containers or ASME containers that have been involved in a fire must not be recharged until they have been retested according to the requirements for their original hydrostatic test and found to be suitable for continued service.

"API-ASME (ASME) container" means a container constructed according to the Rules for Construction of Unfired Pressure Vessels, section VIII, Division 1, American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, 1968 edition.

(6) Containers must not be charged without the consent of the owner.

(7) A permanent caution plate must be provided on the appliance or adjacent to the container outside of any enclosure. It must include the word "caution" and the following or similar instructions.

(a) Be sure all appliance valves are closed before opening container valve.

(b) Connections at appliances, regulators, and containers must be checked periodically for leaks with soapy water or its equivalent.

(c) A match or flame must not be used to check for leaks.

(d) Container valves must be closed except when the equipment is in use.

[Recodified as § 296-307-43521, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43521, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43523 How must containers be charged? Containers must be charged according to DOT specifications.

[Recodified as § 296-307-43523, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43523, filed 10/31/96, effective 12/1/96.]

WAC 296-307-43525 What fire protection must be provided for mobile cook units? Mobile cook units must have at least one approved portable fire extinguisher having a minimum rating of 8-B, C.

[Recodified as § 296-307-43525, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-43525, filed 10/31/96, effective 12/1/96.]

WAC 296-307-440 LP-gas service stations.

[Recodified as § 296-307-440, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-440, filed 10/31/96, effective 12/1/96.]

WAC 296-307-44001 What does this section cover? WAC 296-307-440 applies to storage containers, dispensing devices, and pertinent equipment in service stations where LP-gas is stored and dispensed into fuel tanks of motor vehicles. LP-gas service stations must meet all requirements of WAC 296-307-410 and the requirements of this section.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-44001, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-44001, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44001, filed 10/31/96, effective 12/1/96.]

WAC 296-307-44003 How must storage containers be designed and classified? Storage containers must be designed and classified according to the following table:

Container type	For gases with vapor press. Not to exceed lb. per sp. in. gauge 100°F (37.8°C.)	Minimum design pressure of container lb. per sp. in. gauge	
		1949 and earlier editions of ASME Code (Par. U-68, U-69)	1949 edition of ASME Code (Par.U-200, U-201);1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of ASME Code; All editions of API-ASME Code ²
200 ¹	215	200	250

¹Container type may be increased by increments of 25. The minimum design pressure of containers shall be 100% of the container type designation when constructed under 1949 or earlier editions of ASME Code (Par. U-68 and U-69). The minimum design pressure of containers shall be 125% of the container type designation when constructed

under: 1. The 1949 ASME Code (Par. U-200 and U-201), 2. 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of the ASME Code, and 3. All editions of the API-ASME Code.

²Construction of containers under the API-ASME Code is not authorized after July 1, 1961.

[Recodified as § 296-307-44003, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-44005 What requirements apply to valves and accessories? (1) A filling connection on the container must be fitted with one of the following:

(a) A combination back-pressure check and excess flow valve.

(b) One double or two single back-pressure valves.

(c) A positive shut-off valve, in conjunction with either:

(i) An internal back-pressure valve; or

(ii) An internal excess flow valve.

Instead of an excess flow valve, filling connections may be fitted with a quick-closing internal valve that only opens during operating periods. The mechanism for such valves may have a secondary control that will close automatically in case of fire. The melting point for a fusible plug must be a maximum of 220°F.

(2) A filling pipe inlet terminal off the container must have a positive shut-off valve and either:

(a) A back pressure check valve; or

(b) An excess flow check valve.

(3) All openings in the container must have approved excess flow check valves.

Exceptions:

- (a) Filling connections;
- (b) Safety-relief connections;
- (c) Liquid-level gauging devices; and
- (d) Pressure gauge connections.

(4) All container inlets and outlets must be labeled to designate whether they connect with vapor or liquid (labels may be on valves).

Exceptions:

- (a) Safety-relief valves;
- (b) Liquid-level gauging devices; and
- (c) Pressure gauges.

(5) Each storage container must have a suitable pressure gauge.

[Recodified as § 296-307-44005, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-44007 What requirements apply to safety devices? (1) All safety-relief devices must be installed as follows:

(a) On the container and directly connected with the vapor space.

(b) Safety-relief valves and discharge piping shall be protected against physical damage. The outlet must have loose-fitting rain caps. There shall be no return bends or restrictions in the discharge piping.

(c) The discharge from two or more safety-relief valves with the same pressure settings may be run into a common discharge header. The cross-sectional area of such header must be at least equal to the sum of the individual discharges.

(d) Discharge from a safety-relief device that terminates in or beneath any building is prohibited.

(2) Aboveground containers must have safety-relief valves as follows:

(a) The rate of discharge, which may be provided by one or more valves, must be at least that specified in WAC 296-307-41025(2).

(b) The discharge from safety-relief valves must be vented upward to the open air to prevent impingement of escaping gas upon the container. You must use loose-fitting rain caps. On a container having a water capacity greater than 2,000 gallons, the discharge from the safety-relief valves must be vented upward away from the container to a point at least 7 feet above the container. Provisions must be made so that any liquid or condensate accumulation inside the relief valve or its discharge pipe will not render the valve inoperative. If a drain is used, you must protect the container, adjacent containers, piping, or equipment against impingement of flame resulting from ignition of the product escaping from the drain.

(3) Underground containers must have safety-relief valves as follows:

(a) The discharge from safety-relief valves must be piped upward to a point at least 10 feet above the ground. The discharge lines or pipes must be adequately supported and protected against physical damage.

(b) In areas where the manhole or housing may flood, the discharge from regulator vent lines should be above the highest probable water level.

(c) If no liquid is put into a container until after it is buried and covered, the rate of discharge of the relief valves may be reduced to at least 30 percent of the rate shown in WAC 296-307-41025(2). If liquid fuel is present during installation of containers, the rate of discharge must be the same as for aboveground containers. Only empty containers may be uncovered.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-44007, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-44007, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-44007, filed 10/31/96, effective 12/1/96.]

WAC 296-307-44009 What is the maximum capacity allowed for containers? Individual storage containers must be a maximum of 30,000 gallons water capacity.

[Recodified as § 296-307-44009, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-44009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-44011 How must storage containers be installed? (1) Each storage container used exclusively in service station operation must comply with the following table. This table outlines the minimum distances from a container to a building, group of buildings, or adjoining property lines that may be built on.

Water capacity per container (gallons)	Minimum distances	
	Aboveground and underground (feet)	Between aboveground containers (feet)
Up to 2,000	25	3
Over 2,000	50	5

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Note: The above distances may be reduced to at least 10 feet for service station buildings of other than wood frame construction.

(a) Readily ignitable material including weeds and long dry grass, must be removed within 10 feet of containers.

(b) The minimum separation between LP-gas containers and flammable liquid tanks must be 20 feet and the minimum separation between a container and the centerline of the dike must be 10 feet.

(c) LP-gas containers located near flammable liquid containers must be protected against the flow or accumulation of flammable liquids by diking, diversion curbs, or grading.

(d) LP-gas containers located within diked areas for flammable liquid containers are prohibited.

(e) Field welding is permitted only on saddle plates or brackets that were applied by the container manufacturer.

(f) When permanently installed containers are interconnected, you must allow for expansion, contraction, vibration, and settling of containers and interconnecting piping. Where flexible connections are used, they must be approved and designed for a bursting pressure of at least five times the vapor pressure of the product at 100°F. Using nonmetallic hose is prohibited for interconnecting containers.

(g) Where high water table or flood conditions may be encountered, you must protect against container flotation.

(2) Aboveground containers must be installed according to this section.

(a) Containers may be installed horizontally or vertically.

(b) Containers must be protected by crash rails or guards to prevent physical damage unless they are protected by location. Servicing vehicles within 10 feet of containers is prohibited.

(c) Container foundations must be of substantial masonry or other noncombustible material. Containers must be mounted on saddles that permit expansion and contraction, and must provide against excess stresses. Corrosion protection must be provided for tank-mounting areas. Structural metal container supports must be protected against fire.

Exception: This protection is not required on prefabricated storage and pump assemblies, mounted on a common base, with container bottom a maximum of 24 inches above ground with water capacity of 2,000 gallons or less, if the piping connected to the storage and pump assembly is flexible enough to minimize breakage or leakage in case container supports fail.

(3) Underground containers must be installed according to this section.

(a) Containers must be given a protective coating before being placed underground. This coating must be equivalent to hot-dip galvanizing or to two coatings of red lead followed by a heavy coating of coal tar or asphalt. During installation, take care to minimize abrasion or other damage to the coating. Repair coating damage before back-filling.

(b) Containers must be set on a firm foundation (firm earth may be used) and surrounded with earth or sand firmly tamped in place. Backfill should be free of rocks or other abrasive materials.

(c) A minimum of 2 feet of earth cover must be provided. Where ground conditions make impractical, equivalent protection against physical damage must be provided. The por-

tion of the container to which manhole and other connections are attached may be left uncovered. If there is vehicle traffic at the site, containers must be protected by a concrete slab or other cover to prevent the weight of a loaded vehicle imposing a load on the container shell.

[Recodified as § 296-307-44011. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44011, filed 10/31/96, effective 12/1/96.]

WAC 296-307-44013 What equipment must be protected against tampering? Valves, regulators, gauges, and other container fittings must be protected against tampering and physical damage.

[Recodified as § 296-307-44013. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44013, filed 10/31/96, effective 12/1/96.]

WAC 296-307-44015 What requirements apply to the transport truck unloading point? (1) During unloading, the transport truck must not be parked on public thoroughfares and must be at least 5 feet from storage containers. The truck must be positioned so that shut-off valves are accessible.

(2) The filling pipe inlet terminal must not be located within a building nor within 10 feet of any building or driveway. It must be protected against physical damage.

[Recodified as § 296-307-44015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-44017 What requirements apply to piping, valves, and fittings? (1) Piping may be underground, aboveground, or a combination of both. It must be well supported and protected against physical damage and corrosion.

(2) Piping laid beneath driveways must be installed to prevent physical damage by vehicles.

(3) Piping must be wrought iron or steel (black or galvanized), brass or copper pipe; or seamless copper, brass, or steel tubing and must be suitable for a minimum pressure of 250 psig. Pipe joints may be screwed, flanged, brazed, or welded. The use of aluminum alloy piping or tubing is prohibited.

(4) All shut-off valves (liquid or gas) must be suitable for LP-gas service and designed for at least the maximum pressure to which they may be subjected. Valves that may be subjected to container pressure must have a rated working pressure of at least 250 psig.

(5) All materials used for valve seats, packing, gaskets, diaphragms, etc., must be resistant to the action of LP-gas.

(6) Fittings must be steel, malleable iron, or brass having a minimum working pressure of 250 psig. Cast iron pipe fittings, such as ells, tees and unions must not be used.

(7) All piping must be tested after assembly and proved free from leaks at least at the normal operating pressures.

(8) You must allow for expansion, contraction, jarring, and vibration, and for settling. You may use flexible connections.

[Recodified as § 296-307-44017. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44017, filed 10/31/96, effective 12/1/96.]

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WAC 296-307-44019 What requirements apply to pumps and accessory equipment? All pumps and accessory equipment must be suitable for LP-gas service, and designed for at least the maximum pressure to which they may be subjected. Accessories must have a minimum rated working pressure of 250 psig. Positive displacement pumps must have suitable pressure actuated bypass valves permitting flow from pump discharge to storage container or pump suction.

[Recodified as § 296-307-44019. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44019, filed 10/31/96, effective 12/1/96.]

WAC 296-307-44021 What requirements apply to LP-gas dispensing devices? (1) Meters, vapor separators, valves, and fittings in the dispenser must be suitable for LP-gas service and must be designed for a minimum working pressure of 250 psig.

(2) Provisions must be made for venting LP-gas from a dispensing device to a safe location.

(3) Pumps used to transfer LP-gas must allow control of the flow and to prevent leakage or accidental discharge. Means must be provided outside the dispensing device to readily shut off the power in the event of fire or accident.

(4) A manual shut-off valve and an excess flow check valve must be installed downstream of the pump and ahead of the dispenser inlet.

(a) Dispensing hose must be resistant to the action of LP-gas in the liquid phase and designed for a minimum bursting pressure of 1,250 psig.

(b) An excess flow check valve or automatic shut-off valve must be installed at the terminus of the liquid line at the point of attachment of the dispensing hose.

(5) LP-gas dispensing devices must be located at least 10 feet from aboveground storage containers greater than 2,000 gallons water capacity. The dispensing devices must be at least 20 feet from any building (not including canopies), basement, cellar, pit, or line of adjoining property that may be built on and at least 10 feet from sidewalks, streets, or thoroughfares. No drains or blowoff lines must be directed into or in proximity to the sewer systems used for other purposes.

(a) LP-gas dispensing devices must be installed on a concrete foundation or as part of a complete storage and dispensing assembly mounted on a common base, and must be adequately protected from physical damage.

(b) LP-gas dispensing devices must not be installed within a building.

Exception: Dispensing devices may be located under a weather shelter or canopy if the area is not enclosed on more than two sides. If the enclosing sides are adjacent, the area shall be properly ventilated.

(6) Dispensing LP-gas into the fuel container of a vehicle shall be performed by a competent attendant who shall remain at the LP-gas dispenser during the entire transfer operation.

[Recodified as § 296-307-44021. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44021, filed 10/31/96, effective 12/1/96.]

WAC 296-307-44023 Is smoking allowed at LP-gas service stations? Smoking is prohibited on the driveway of service stations in the dispensing areas or transport truck

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unloading areas. Conspicuous signs prohibiting smoking must be posted within sight of the customer being served. Letters on such signs must be at least 4 inches high. The motors of all vehicles being fueled must be shut off during the fueling operations.

[Recodified as § 296-307-44023. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44023, filed 10/31/96, effective 12/1/96.]

WAC 296-307-44025 What fire protection must be provided at LP-gas service stations? Each service station must have at least one approved portable fire extinguisher with at least an 8-B, C, rating.

[Recodified as § 296-307-44025. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-44025, filed 10/31/96, effective 12/1/96.]

Part U-3 Other Hazardous Materials

WAC 296-307-450 Other hazardous materials.

[Recodified as § 296-307-450. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-450, filed 10/31/96, effective 12/1/96.]

WAC 296-307-45001 What general requirements apply to hazardous materials and flammable and combustible liquids? (1) Fuel and other flammable and combustible liquids must be stored, handled and marked according to the recommendations of the National Fire Protection Association (NFPA) or other agencies with jurisdiction.

(2) You must ensure that compressed gas cylinders under your control are in a safe condition to the extent that you can determine by visual inspection. Inspections must be conducted according to the hazardous materials regulations of the Department of Transportation (49 CFR Parts 171-179 and 14 CFR Part 103).

Exception: Where those regulations are not applicable, inspections must be conducted according to the Compressed Gas Association Pamphlets C-6-1968 and C-8-1962.

(3) Compressed gas cylinders, portable tanks, and cargo tanks must have pressure relief devices installed and maintained according to Compressed Gas Association Pamphlets S-1.1-1963 and 1965 addenda and S-1.2-1963.

(4) The following equipment must be shut down during refueling:

- Tractors;
- Agricultural equipment employing open flames; and
- Equipment with integral containers, such as flame cultivators, weed burners.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-45001, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-45001. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45001, filed 10/31/96, effective 12/1/96.]

WAC 296-307-45003 What requirements apply to dip tanks containing flammable or combustible liquids? Dip tanks containing flammable or combustible liquids must meet the requirements of WAC 296-307-450.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-45003, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-45003. 97-09-013, filed

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4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-45005 What definitions apply to this section? "Dip tank" means a tank, vat, or container of flammable or combustible liquid in which articles or materials are immersed for coating, finishing, treating, or similar processes.

"Vapor area" means any area containing dangerous quantities of flammable vapors in the vicinity of dip tanks, drainboards or other drying, conveying, or other equipment during operation or shutdown.

[Recodified as § 296-307-45005. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-45007 What requirements must ventilation systems meet? (1) Vapor areas must be limited to the smallest practical space by maintaining a properly designed ventilation system arranged to move air from all directions towards the vapor area and to a safe outside location. Ventilating systems must meet the requirements of the Standards for Blower and Exhaust Systems (NFPA Pamphlet No. 91-1969).

(2) For drying operations that use a heating system that is a potential source of ignition, the ventilation system must have a prevention process that must operate before the heating system can be started. The failure of any ventilating fan must automatically shut down the heating system. The installation must meet the requirements of the Standard for Ovens and Furnaces (NFPA No. 86A-1969).

[Recodified as § 296-307-45007. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45007, filed 10/31/96, effective 12/1/96.]

WAC 296-307-45009 What general requirements apply to the construction of dip tanks? (1) Dip tanks and drainboards must be constructed of substantial noncombustible material, and their supports must be of heavy metal, reinforced concrete, or masonry. Where dip tanks extend through a floor to the story below or where the weakening of the tank supports by fire may result in the tank collapse, supports should be of material with at least 1-hour fire resistance.

(2) The capacity of the salvage tank must be greater than the capacity of the dip tanks to which they are connected.

(3) All dip tanks exceeding 150 gallons liquid capacity or having a liquid surface area exceeding 4 square feet must be protected by at least one of the automatic extinguishing facilities in WAC 296-307-45021 (2), (3), (4), (5) or (6).

Exception: Hardening and tempering tanks must meet the requirements of WAC 296-307-45023.

(4) Dip tanks that use a conveyor system must be arranged so that, in the event of fire, the conveyor system must automatically stop and the bottom drains shall open. Conveyor systems must automatically stop unless required ventilation is in full operation.

(5) When dip tank liquids are heated by dipping heated articles or by other application of heat to the liquid, you must prevent a temperature rise greater than 50°F below the flash-point of the liquid.

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[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-45009, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-45009, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-45009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-45011 How must overflow pipes for dip tanks be constructed? (1) Dip tanks of over 150 gallons in capacity or 10 square feet in liquid surface area must have a properly trapped overflow pipe leading to a safe location outside buildings. When practical, smaller dip tanks should be equipped the same way.

(2) The location and arrangement of the discharge of the overflow pipe must prevent hazards if the combustible contents of the dip tank overflows through the overflow pipe from fire fighting water. The overflow pipe should be large enough to conduct the maximum amount of water expected to be applied from automatic sprinklers or other sources in a fire.

(3) Overflow pipes must be large enough to overflow the maximum delivery of dip tank liquid fill pipes. They must be at least 3 inches in diameter or larger depending on the area of the liquid surface and the length and pitch of pipe.

(4) Piping connections on drains and overflow lines must be designed to allow access for inspection and cleaning of the interior.

(5) The bottom of the overflow connection must be at least 6 inches below the top of the tank.

[Recodified as § 296-307-45011, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-45011, filed 10/31/96, effective 12/1/96.]

WAC 296-307-45013 How must the bottom drains of dip tanks be constructed? (1) Dip tanks over 500 gallons in liquid capacity must have bottom drains that are automatically and manually arranged to quickly drain the tank in the event of fire. Manual operation must be from a safely accessible location. Where gravity flow is not practical, automatic pumps are required.

Exception: This requirement does not apply if the viscosity of the liquid at normal atmospheric temperature makes this impractical.

(2) Bottom drains must be trapped and discharged to a closed properly vented salvage tank or to a safe location outside.

(3) According to tank capacity, the diameter of the bottom drainpipe must be at least the following:

Gallons	Inches
500 to 750	3
750 to 1,000	4
1,000 to 2,500	5
2,500 to 4,000	6
Over 4,000	8

[Recodified as § 296-307-45013, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-45013, filed 10/31/96, effective 12/1/96.]

WAC 296-307-45015 How must liquids used in dip tanks be stored and handled? The storage of flammable and combustible liquids in connection with dipping operations must meet the requirements of the National Fire Protec-

tion Association Standard for Drycleaning Plants, NFPA No. 32-1970; the National Fire Protection Association Standard for the Manufacture of Organic Coatings, NFPA No. 35-1970; the National Fire Protection Association Standard for Solvent Extraction Plants, NFPA No. 36-1967; and the National Fire Protection Association Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, NFPA No. 37-1970.

Where portable containers are used to replenish flammable and combustible liquids, you must ensure that both the container and tank are positively grounded and electrically bonded to prevent static electric sparks.

[Recodified as § 296-307-45015, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-45015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-45017 What measures must an employer take to prevent hazards from electrical and other ignition sources? (1) In vapor areas, there must be no open flames, spark producing devices, or heated surfaces hot enough to ignite vapors. Electrical wiring and equipment in any vapor area must be explosion proof as required in chapter 296-307 WAC Part T for Class I locations and must meet the requirements of chapter 296-307 WAC Part T.

Exception: The requirements for electrostatic apparatus are in WAC 296-307-45027.

(2) Electrical equipment is prohibited in the vicinity of dip tanks, drainboards, or drying operations that are subject to splashing or dripping of dip tank liquids, unless the equipment is approved for locations containing deposits of readily ignitable residues and explosive vapors.

Exception: Wiring in rigid conduit or in threaded boxes or fittings containing no taps, splices, or terminal connections are permitted. Other exceptions are in WAC 296-307-45027.

(3) In any floor space outside a vapor area but within 20 feet and not separated by tight partitions, open flames or spark producing devices are prohibited. Electrical wiring and equipment must meet the requirements of chapter 296-307 WAC Part T.

Exception: Open flames are only allowed as specifically permitted in NFPA Standard No. 86A-1969, Ovens and Furnaces, paragraph 200-7.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-45017, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-45017, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-45017, filed 10/31/96, effective 12/1/96.]

WAC 296-307-45019 How must dip tanks be operated and maintained? (1) The area around dip tanks must be kept as clear of combustible stock as practical and must be kept entirely free of combustible debris.

(2) When waste or rags are used in connection with dipping operations, approved metal waste cans must be provided. All impregnated rags or waste must be deposited in the cans immediately after use. The contents of waste cans must be properly disposed of at least once daily at the end of each shift.

(3) You must periodically inspect or test all dip tank facilities, including covers, overflow pipe inlets and dis-

charge, bottom drains and valves, electrical wiring and equipment and grounding connections, ventilating facilities, and all extinguishing equipment. Any defects found must be promptly corrected.

(4) "No smoking" signs in large letters on contrasting color background must be conspicuously posted in the vicinity of dip tanks.

[Recodified as § 296-307-45019, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45019, filed 10/31/96, effective 12/1/96.]

WAC 296-307-45021 What requirements must fire extinguishing systems meet? (1) Dip tank areas must have portable fire extinguishers suitable for flammable and combustible liquid fires, and that meet the requirements of WAC 296-307-085.

(2) Automatic water spray extinguishing systems must meet the requirements of ANSI/NFPA No. 13, Sprinkler Systems, and NFPA No. 13, Sprinkler Systems Maintenance, and shall be arranged to protect tanks, drainboards, and stock over drainboards.

(3) Automatic foam extinguishing systems must meet the requirements of ANSI/NFPA No. 11, Foam Extinguishing Systems.

(a) The foam-producing material must be suitable for intended use, taking into account the characteristics of the dip tank liquid.

(b) The overflow pipe must be arranged to prevent foam from floating away and clogging the overflow pipe. You must use one of the following methods:

(i) The overflow pipe may be extended through tank wall and terminated in an ell pointing downward. The bottom of the overflow pipe at the point it enters the tank wall should be a maximum of 2 inches above the opening or the face of the ell.

(ii) The overflow pipe inlet may have a removable screen of 1/4-inch mesh with an area at least twice the cross-sectional area of overflow pipe. Screens that may be clogged by dip tank ingredients must be inspected and cleaned periodically.

(4) Automatic carbon dioxide systems must meet the requirements of ANSI/NFPA No. 12, Carbon Dioxide, and must be arranged to protect dip tanks and drainboards. The system must be arranged to protect stock over drainboards unless the stock is otherwise protected with automatic extinguishing facilities.

(5) Dry chemical extinguishing systems must meet the requirements of ANSI/NFPA No. 17, Dry Chemical Systems, and must be arranged to protect dip tanks and drainboards. The system must be arranged to protect stock over drainboards unless the stock is otherwise protected with automatic extinguishing facilities.

(6) Dip tank covers must meet the following requirements:

(a) Covers arranged to close automatically in the event of fire must be actuated by approved automatic devices and shall also be designed for manual operation.

(b) Covers must be of substantial noncombustible material or tin-clad with enclosing metal applied with locked joints.

(c) Chains or wire rope must be used for the cover support or operating mechanism where a burnt cord would interfere with the device action.

(d) Covers must be kept closed when tanks are not in use.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-45021, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-45021, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45021, filed 10/31/96, effective 12/1/96.]

WAC 296-307-45023 What requirements apply to hardening and tempering tanks? (1) Tanks must be located as far as practical from furnaces and away from combustible floors.

(2) Tanks must have a noncombustible hood and vent or other equivalent means of venting to the outside of the building that will serve as a vent in case of fire. All vent ducts must be treated as flues and be kept away from combustible roofs or materials.

(3) Tanks must be designed so that the maximum workload is incapable of raising the temperature of the cooling medium to within 50°F below its flashpoint, or tanks must have circulating cooling systems that will provide equal protection.

(4) Tanks must have a high temperature limit switch arranged to sound an alarm when the temperature of the quenching medium reaches within 50°F below the flashpoint. If practical from an operating standpoint, such limit switches must also shut down conveying equipment supplying work to the tank.

(5) All hardening and tempering tanks exceeding 500 gallons liquid capacity or having a liquid surface area exceeding 25 square feet must be protected with at least one of the automatic extinguishing facilities conforming to WAC 296-307-45021 (2), (3), (4), (5) or (6).

(6) Using air under pressure to fill or to agitate oil tanks is prohibited.

(7) Bottom drains may be combined with the oil circulating system or arranged independently to drain the oil to a safe location. The drain valve must be operated automatically with approved heat actuated devices or manually. The valve of a manual device must be operated from a safe distance.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-45023, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-45023, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45023, filed 10/31/96, effective 12/1/96.]

WAC 296-307-45025 What requirements apply to flow coat applications? (1) All dip tank requirements must apply to flow coat operations.

(2) All piping must be strongly erected and rigidly supported.

(3) Paint must be supplied by direct low-pressure pumping arranged to automatically shut down by an approved heat actuated device in the case of fire, or paint may be supplied by a gravity tank with a maximum capacity of 10 gallons.

(4) The sump area and any areas on which paint flows should be considered the area of dip tank.

[Recodified as § 296-307-45025, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-45025, filed 10/31/96, effective 12/1/96.]

WAC 296-307-45027 What requirements apply to electrostatic apparatus? (1) All requirements of WAC 296-307-450 apply to electrostatic detearing equipment unless otherwise specified.

(2) Electrostatic apparatus and devices used in connection with paint detearing operations must be approved.

(3) Transformers, powerpacks, control apparatus, and all other electrical portions of the equipment must be located outside the vapor area or must meet the requirements of WAC 296-307-45017.

Exception: This requirement does not apply to high voltage grids and their connections.

(4) Electrodes must be substantially constructed, rigidly supported in permanent locations, and insulated from ground. Insulators must be nonporous and noncombustible.

(5) High voltage leads to electrodes must be permanently supported on suitable insulators, and guarded against accidental contact or grounding. An automatic means must be provided for grounding and discharging any accumulated residual charge on the electrode assembly or the secondary circuit of the high voltage transformer when the transformer primary is disconnected from the supply source.

(6) Maintain space between goods being deteared and electrodes or conductors of at least twice the sparking distance. A sign stating the sparking distance must be conspicuously posted near the assembly.

(7) Goods being deteared using the electrostatic process must be supported on conveyors. The conveyors must be arranged to maintain safe distances between the goods and the electrodes at all times. All goods must be supported to prevent any swinging or movement that would reduce the clearance to less than twice the sparking distance.

Exception: The electrostatic process is prohibited where goods being deteared are manipulated by hand.

(8) Electrostatic apparatus must have automatic controls that will operate immediately to disconnect the power supply to the high voltage transformer and to signal the operator under any of the following conditions:

(a) The ventilating fans stop or the ventilating equipment fails for any cause;

(b) The conveyor carrying goods past the high voltage grid stops;

(c) A ground or imminent ground at any point on the high voltage system occurs; or

(d) Clearance is reduced below twice the sparking distance.

(9) Adequate fencing, railings, or guards must be placed so that they ensure that the process is safely isolated from plant storage or employees. Such railings, fencing and guards must be of conducting material, adequately grounded, and should be at least 5 feet from processing equipment.

(10) Electrode insulators must be kept clean and dry.

(11) The detearing area must be ventilated according to WAC 296-307-45007.

(12) All areas for detearing must be protected by automatic sprinklers where this protection is available. Where this protection is not available, other approved automatic extinguishing equipment must be provided.

(13) Drip plates and screens subject to paint deposits must be removable and shall be taken to a safe place for cleaning.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-45027, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-45027, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-45027, filed 10/31/96, effective 12/1/96.]

WAC 296-307-45029 What requirements apply to roll coating applications? Sparks from static electricity must be prevented by electrically bonding and grounding all rotating metal and other machinery, and by the installation of static collectors or maintaining a conductive atmosphere such as a high relative humidity.

[Recodified as § 296-307-45029, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-45029, filed 10/31/96, effective 12/1/96.]

Part V Welding

WAC 296-307-475 Welding, cutting, and brazing.

[Recodified as § 296-307-475, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-475, filed 10/31/96, effective 12/1/96.]

WAC 296-307-47501 What definitions apply to this part? "Welder" and "welding operator" mean any operator of electric or gas welding and cutting equipment.

All other welding terms are defined according to American Welding Society, Terms and Definitions, A3.0-1969.

[Recodified as § 296-307-47501, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-47501, filed 10/31/96, effective 12/1/96.]

WAC 296-307-480 Installation and operation of oxygen fuel gas systems for welding and cutting.

[Recodified as § 296-307-480, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-480, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48001 What general requirements apply to oxygen fuel gas systems? (1) Explosive mixtures of fuel gases and air or oxygen must be guarded against. No accessory that allows air or oxygen to mix with flammable gases prior to use must be allowed unless approved for that purpose.

Exception: Air or oxygen may mix with flammable gases at the burner or in a standard torch.

(2) Acetylene must never be generated, piped (except in approved cylinder manifolds) or used at a pressure in excess of 15 psi gauge pressure or 30 psi absolute pressure. (The 30 psi absolute pressure limit is intended to prevent unsafe use of acetylene in pressurized chambers such as caissons, underground excavations or tunnel construction.) Using liquid acetylene is prohibited.

Exception: This requirement does not apply to storage of acetylene dissolved in a suitable solvent in cylinders manufactured and maintained according to DOT requirements, or to acetylene for chemical use.

(3) Only approved apparatus such as torches, regulators or pressure-reducing valves, acetylene generators, and manifolds must be used. Replacement tips may be used on approved torches, if the replacement tips are made to the same specifications as the original, or when replacements are used with convertor/adaptors that meet the same specifications.

(4) Before leaving any employee in charge of the oxygen or fuel-gas supply equipment, including generators, and oxygen or fuel-gas distribution piping systems, you must ensure that the employee has received proper instruction and is competent to do the work. Rules and instructions covering the operation and maintenance of oxygen or fuel-gas supply equipment including generators, and oxygen or fuel-gas distribution piping systems must be readily available.

[Recodified as § 296-307-48001. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48001, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48003 What requirements apply to portable cylinders? All portable cylinders used for storing and shipping compressed gases must be constructed and maintained according to DOT regulations.

(1) Compressed gas cylinders must be legibly marked with either the chemical or the trade name of the gas. The marking must be a permanent stencil, stamp, or label. Whenever practical, the marking must be located on the shoulder of the cylinder.

(2) Compressed gas cylinders must have connections that meet the requirements of the American National Standard Compressed Gas Cylinder Valve Outlet and Inlet Connections, ANSI B 57.1-1965.

(3) All cylinders with a water weight capacity greater than thirty pounds must have means of connecting a valve protection cap or with a collar or recess to protect the valve.

[Recodified as § 296-307-48003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48005 What general requirements apply to storing compressed gas cylinders? (1) Cylinders must be kept away from radiators and other sources of heat.

(2) Indoors, cylinders must be stored in a well-protected, well-ventilated, dry area, at least twenty feet from highly combustible materials such as oil or excelsior. Cylinders should be stored in assigned places away from elevators, stairs, or gangways. Assigned storage spaces must be located where cylinders will not be knocked over or damaged by passing or falling objects, or subject to tampering. All cylinder enclosures must be ventilated.

(3) Empty cylinders must have their valves closed.

(4) Valve protection caps on cylinders designed to accept a cap, must always be in place and hand-tight, except when cylinders are in use or connected for use.

[Recodified as § 296-307-48005. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48007 How must fuel-gas cylinders be stored? Cylinders stored indoors, except those in use or

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attached ready for use, must be limited to a total gas capacity of 2,000 cubic feet or 300 pounds of LP-gas.

(1) Cylinders in excess of 2,000 cubic feet total gas capacity or 300 pounds of LP-gas, must be stored in a separate room or compartment that meets the requirements of 252 (a)(8) and (9) CFR, or cylinders must be kept outside or in a special building. Special buildings, rooms or compartments must be free from open flame for heating or lighting and must be well ventilated. They may also be used for storage of a maximum of 600 pounds of calcium carbide, when contained in metal containers complying with 252 (a)(7)(a) and (b) CFR. Signs should be conspicuously posted in such rooms reading, "Danger—No smoking, matches or open lights," or other equivalent wording.

(2) Acetylene cylinders must be stored valve end up.

[Recodified as § 296-307-48007. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48007, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48009 How must oxygen cylinders be stored? (1) Oxygen cylinders must not be stored near highly combustible material, especially oil and grease; or near reserve stocks of carbide and acetylene or other fuel-gas cylinders, or near any other substance likely to cause or accelerate fire; or in an acetylene generator compartment.

(2) Oxygen cylinders stored in outside generator houses must be separated from the generator or carbide storage rooms by a noncombustible partition having a fire-resistance rating of at least one hour. This partition must be without openings and must be gastight.

(3) Oxygen cylinders in storage must be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum of 20 feet or by a noncombustible barrier at least five feet high having a fire-resistance rating of at least one-half hour. (Cylinders "in-use," secured to a hand truck or structural member, with regulators, hoses, and torch temporarily removed for security purposes overnight or weekends, are not considered "in-storage.")

(4) Where a liquid oxygen system is to be used to supply gaseous oxygen for welding or cutting and the system has a storage capacity of more than 13,000 cubic feet of oxygen (measured at 14.7 psi(a) and 70°F), connected in service or ready for service, or more than 25,000 cubic feet of oxygen (measured at 14.7 psi(a) and 70°F), including unconnected reserves on hand at the site, it must meet the requirements of the Standard for Bulk Oxygen Systems at Consumer Sites, NFPA No. 566-1965.

[Recodified as § 296-307-48009. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48011 What general operating procedures apply to working with cylinders and containers? (1) The numbers and markings stamped into cylinders must not be tampered with.

(2) Cylinders, cylinder valves, couplings, regulators, hose, and apparatus must be kept free from oily or greasy substances. Oxygen cylinders or apparatus must not be handled with oily hands or gloves. A jet of oxygen must never be

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permitted to strike an oily surface, greasy clothes, or enter a fuel oil or other storage tank.

(3) Cylinders must be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them, or fire-resistant shields must be provided.

(4) No person, other than the gas supplier, may attempt to mix gases in a cylinder. No one, except the owner of the cylinder or person authorized by the owner, may refill a cylinder.

(5) Cylinders must not be placed where they might become part of an electric circuit. Contacts with third rails, trolley wires, etc., must be avoided.

(6) Fuel-gas cylinders must be placed with valve end up whenever they are in use. Liquefied gases must be stored and shipped with the valve end up.

(7) A suitable cylinder truck, chain, or other steadying device must be used to prevent cylinders from being knocked over while in use.

[Recodified as § 296-307-48011. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48011, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48013 What requirements apply to safety devices on cylinders? (1) Valve-protection caps must not be used for lifting cylinders from one vertical position to another. Bars must not be used under valves or valve-protection caps to pry cylinders loose when frozen to the ground or otherwise fixed; we recommend using warm (not boiling) water. Valve-protection caps are designed to protect cylinder valves from damage.

(2) Cylinders without fixed hand wheels must have keys, handles, or nonadjustable wrenches on valve stems while these cylinders are in service. In multiple cylinder installations only one key or handle is required for each manifold.

(3) No one may tamper with safety devices in cylinders or valves.

(4) Nothing may be placed on top of an acetylene cylinder when in use that may damage the safety device or interfere with the quick closing of the valve.

(5) Where a special wrench is required it must be left in position on the stem of the valve while the cylinder is in use so that the fuel-gas flow can be quickly turned off in case of emergency. In the case of manifolded or coupled cylinders at least one such wrench must always be available for immediate use.

(6) Cylinders with leaking fuse plugs or other leaking safety devices should be plainly marked with a warning not to approach them with a lighted cigarette or other source of ignition. You should notify the supplier promptly and follow the supplier's instructions as to their return.

[Recodified as § 296-307-48013. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48013, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48015 How must cylinders be transported? (1) When transporting cylinders by a crane or derrick, a cradle, boat, or suitable platform must be used. Slings or electric magnets are prohibited for this purpose. Valve-protection caps, where cylinder is designed to accept a cap, must always be in place.

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(2) Unless cylinders are secured on a special truck, regulators must be removed and valve-protection caps, when provided for, must be put in place before cylinders are moved.

(3) When cylinders are transported by powered vehicle they must be secured in a vertical position.

[Recodified as § 296-307-48015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48017 How must cylinders be handled? (1) Cylinders must not be dropped or struck or permitted to strike each other violently.

(2) Cylinders must be handled carefully. Cylinders must not be subjected to rough handling, knocks, or falls that are liable to damage the cylinder, valve or safety devices and cause leakage.

(3) Cylinders must never be used as rollers or supports, whether full or empty.

[Recodified as § 296-307-48017. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48017, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48019 What requirements apply to cylinder valves? (1) Cylinder valves must be closed before moving cylinders.

(2) Cylinder valves must be closed when work is finished.

(3) Valves of empty cylinders must be closed.

(4) A hammer or wrench must not be used to open cylinder valves. If valves cannot be opened by hand, the supplier must be notified.

(5) Cylinder valves must not be tampered with nor should any attempt be made to repair them. If you have trouble with a cylinder, you should send a report to the supplier indicating the character of the trouble and the cylinder's serial number. You must follow the supplier's instructions on what to do with the cylinder.

(6) Complete removal of the stem from a diaphragm-type cylinder valve must be avoided.

(7) If cylinders are found to have leaky valves or fittings that cannot be stopped by closing of the valve, the cylinders must be taken outdoors away from sources of ignition and slowly emptied.

(8) The cylinder valve must always be opened slowly.

(9) An acetylene cylinder valve must not be opened more than one and one-half turns of the spindle, and preferably no more than three-fourths of a turn.

[Recodified as § 296-307-48019. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48019, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48021 What requirements apply to cylinder regulators? (1) Unless connected to a manifold, oxygen from a cylinder must first have an oxygen regulator attached to the cylinder valve.

(2) Before connecting a regulator to a cylinder valve, the valve must be opened slightly and closed immediately. The valve must be opened while standing to one side of the outlet; never in front of it. Fuel-gas cylinder valves must not be cracked near other welding work or near sparks, flame, or other possible sources of ignition.

(3) Before a regulator is removed from a cylinder valve, the cylinder valve must be closed and the gas released from the regulator.

(4) Fuel-gas must not be used from cylinders through torches or other devices equipped with shut-off valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.

[Recodified as § 296-307-48021, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48021, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48023 What requirements apply to fuel-gas manifolds? (1) Manifolds must be approved either separately for each component part or as an assembled unit.

(2) Fuel-gas cylinders connected to one manifold inside a building must be limited to a maximum total capacity of 300 pounds of LP-gas or 3,000 cubic feet of other fuel-gas. More than one such manifold with connected cylinders may be located in the same room if the manifolds are at least 50 feet apart or separated by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.

(3) Exception: Fuel-gas cylinders connected to one manifold having an aggregate capacity exceeding 300 pounds of LP-gas or 3,000 cubic feet of other fuel-gas must be located outdoors, or in a separate building or room constructed according to 252 (a)(8) and (9) CFR.

(4) Separate manifold buildings or rooms may also be used for the storage of drums of calcium carbide and cylinders containing fuel gases as provided in WAC 296-307-48007. Such buildings or rooms must have no open flames for heating or lighting and must be well ventilated.

(5) High-pressure fuel-gas manifolds must have approved pressure regulating devices.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-48023, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-48023, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48023, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48025 What requirements apply to high pressure oxygen manifolds? This section applies to cylinders with a DOT service pressure above 200 psig.

(1) Manifolds must be approved either separately for each component or as an assembled unit.

(2) Oxygen manifolds must not be located in an acetylene generator room. Oxygen manifolds must be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum distance of 20 feet or by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.

(3) Oxygen cylinders connected to one manifold must be limited to a total gas capacity of 6,000 cubic feet. More than one such manifold with connected cylinders may be located in the same room if the manifolds are at least 50 feet apart or separated by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.

(4) Exception: An oxygen manifold, to which cylinders having an aggregate capacity of more than 6,000 cubic feet of oxygen are connected, should be located outdoors or in a separate noncombustible building. Such a manifold, if located

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inside a building having other occupancy, must be located in a separate room of noncombustible construction having a fire-resistance rating of at least one-half hour or in an area with no combustible material within 20 feet of the manifold.

(5) An oxygen manifold or oxygen bulk supply system that has storage capacity of more than 13,000 cubic feet of oxygen (measured at 14.7 psia and 70°F), connected in service or ready for service, or more than 25,000 cubic feet of oxygen (measured at 14.7 psia and 70°F), including unconnected reserves on hand at the site, must meet the requirements of the Standard for Bulk Oxygen Systems at Consumer Sites, NFPA No. 566-1965.

(6) High-pressure oxygen manifolds must have approved pressure-regulating devices.

[Recodified as § 296-307-48025, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48025, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48027 What requirements apply to low pressure oxygen manifolds? This section applies to cylinders with a maximum DOT service pressure of 200 psig.

(1) Manifolds must be of substantial construction suitable for use with oxygen at a pressure of 250 psig. They must have a minimum bursting pressure of 1,000 psig and must be protected by a safety-relief device that will relieve at a maximum pressure of 500 psig.

Note: DOT-4L200 cylinders have safety devices that relieve at a maximum pressure of 250 psig (or 235 psig if vacuum insulation is used).

(2) Hose and hose connections subject to cylinder pressure must meet the requirements of WAC 296-307-48049. Hose must have a minimum bursting pressure of 1,000 psig.

(3) The assembled manifold including leads must be tested and proven gas-tight at a pressure of 300 psig. The fluid used for testing oxygen manifolds must be oil-free and not combustible.

(4) The location of manifolds must meet the requirements of WAC 296-307-48025.

(5) The following sign must be conspicuously posted at each manifold:

Low-Pressure Manifold
Do Not Connect High-Pressure Cylinders
Maximum Pressure—250 PSIG

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-48027, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-48027, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48027, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48029 What requirements apply to manifolding portable outlet headers? (1) Portable outlet headers must not be used indoors except for temporary service where the conditions preclude a direct supply from outlets located on the service piping system.

(2) Each outlet on the service piping from which oxygen or fuel-gas is withdrawn to supply a portable outlet header must have a readily accessible shut-off valve.

(3) Hose and hose connections used for connecting the portable outlet header to the service piping must meet the requirements of WAC 296-307-48051.

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(4) Master shut-off valves for both oxygen and fuel-gas must be provided at the entry end of the portable outlet header.

(5) Portable outlet headers for fuel-gas service must have an approved hydraulic back-pressure valve installed at the inlet and preceding the service outlets, unless an approved pressure-reducing regulator, an approved backflow check valve, or an approved hydraulic back-pressure valve is installed at each outlet. Outlets provided on headers for oxygen service may be fitted for use with pressure-reducing regulators or for direct hose connection.

(6) Each service outlet on portable outlet headers must have a valve assembly that includes a detachable outlet seal cap, chained or otherwise attached to the body of the valve.

(7) Materials and fabrication procedures for portable outlet headers must comply with WAC 296-307-48033, 296-307-48035, and 296-307-48041.

(8) Portable outlet headers must have frames that will support the equipment securely in the correct operating position and protect them from damage during handling and operation.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-48029, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-48029, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-48029, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48031 What operating procedures apply to cylinder manifolds? (1) Cylinder manifolds must be installed under the supervision of someone familiar with the proper practices of construction and use.

(2) All component parts used in the methods of manifolding described in WAC 296-307-48023 must have the materials, design and construction approved either separately or as an assembled unit.

(3) All manifolds and parts used in methods of manifolding must be used only for the gas or gases for which they are approved.

(4) When acetylene cylinders are coupled, approved flash arresters must be installed between each cylinder and the coupler block. For outdoor use only, and when the number of cylinders coupled does not exceed three, one flash arrester installed between the coupler block and regulator is acceptable.

(5) Each fuel-gas cylinder lead should have a backflow check valve.

(6) The maximum aggregate capacity of fuel-gas cylinders connected to a portable manifold inside a building must be 3,000 cubic feet of gas.

(7) Acetylene and liquefied fuel-gas cylinders must be manifolded vertically.

(8) The pressure in the gas cylinders connected to and discharged simultaneously through a common manifold must be approximately equal.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-48031, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-48031, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-48031, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48033 How must service piping systems be designed? (1) Piping and fittings must comply with

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Section 2, Industrial Gas and Air Piping Systems, of the American National Standard Code for Pressure Piping, ANSI B 31.1-1967, if they do not conflict with subsections (2) and (3) of this section.

(2) Pipe must be at least Schedule 40 and fittings must be at least standard weight in sizes up to and including 6-inch nominal.

(3) Copper tubing must be Types K or L according to the Standard Specification for Seamless Copper Water Tube, ASTM B88-66a.

(4) Piping must be steel, wrought iron, brass or copper pipe, or seamless copper, brass or stainless steel tubing, except as provided in subsections (5) through (9) of this section.

(5) Oxygen piping and fittings at pressures in excess of 700 psig, must be stainless steel or copper alloys.

(6) Hose connections and hose complying with WAC 296-307-48051 may be used to connect the outlet of a manifold pressure regulator to piping if the working pressure of the piping is 250 psig or less and the length of the hose is a maximum of 5 feet. Hose must have a minimum bursting pressure of 1,000 psig.

(7) When oxygen is supplied to a service piping system from a low-pressure oxygen manifold without an intervening pressure regulating device, the piping system must have a minimum design pressure of 250 psig. A pressure regulating device must be used at each station outlet when the connected equipment is for use at pressures less than 250 psig.

(8) Piping for acetylene or acetylenic compounds must be steel or wrought iron.

(9) Unalloyed copper must only be used for acetylene or acetylenic compounds in listed equipment.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-48033, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-48033, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-48033, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48035 What requirements apply to piping joints? (1) Joints in steel or wrought iron piping must be welded, threaded or flanged. Fittings, such as ells, tees, couplings, and unions, must be rolled, forged or cast steel, malleable iron or nodular iron. Gray or white cast iron fittings are prohibited.

(2) Joints in brass or copper pipe must be welded, brazed, threaded, or flanged. Socket type joints must be brazed with silver-brazing alloy or similar high melting point (not less than 800°F) filler metal.

(3) Joints in seamless copper, brass, or stainless steel tubing must be approved gas tubing fittings or the joints must be brazed. Socket type joints must be brazed with silver-brazing alloy or similar high melting point (not less than 800°F) filler metal.

[Recodified as § 296-307-48035, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-48035, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48037 How must service piping systems be installed? (1) Distribution lines must be installed and maintained in a safe operating condition.

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(2) Piping may be above or below ground. All piping must be run as directly as practical, protected against physical damage, with an allowance for expansion and contraction, jarring and vibration. Pipe laid underground in earth must be below the frost line and protected against corrosion. After assembly, piping must be thoroughly blown out with air or nitrogen to remove foreign materials. For oxygen piping, only oil-free air, oil-free nitrogen, or oil-free carbon dioxide must be used.

(3) Only piping that has been welded or brazed must be installed in tunnels, trenches or ducts. Shut-off valves must be located outside such conduits. Oxygen piping may be placed in the same tunnel, trench or duct with fuel-gas pipelines, if there is good natural or forced ventilation.

(4) Low points in piping carrying moist gas must be drained into drip pots constructed to permit pumping or draining out the condensate at necessary intervals. Drain valves must be installed for this purpose having outlets normally closed with screw caps or plugs. Open end valves or petcocks are prohibited, except that in drips located outdoors, underground, and not readily accessible, valves may be used at such points if they have means to secure them in the closed position. Pipes leading to the surface of the ground must be cased or jacketed where necessary to prevent loosening or breaking.

(5) Gas cocks or valves must be provided for all buildings at points where they will be readily accessible for shutting off the gas supply to these buildings in any emergency. Underground valve boxes or manholes should be avoided wherever possible. There must be a shut-off valve in the discharge line from the generator, gas holder, manifold or other source of supply.

(6) Shut-off valves must not be installed in safety-relief lines in such a manner that the safety-relief device can be rendered ineffective.

(7) Fittings and lengths of pipe must be examined internally before assembly and, if necessary, freed from scale or dirt. Oxygen piping and fittings must be washed out with a suitable solution that will effectively remove grease and dirt but will not react with oxygen.

Note: Hot water solutions of caustic soda or trisodium phosphate are effective for this purpose.

(8) Piping must be thoroughly blown out after assembly to remove foreign materials. For oxygen piping, oil-free air, oil-free nitrogen, or oil-free carbon dioxide must be used. For other piping, air or inert gas may be used.

(9) When flammable gas lines or other parts of equipment are being purged of air or gas, open lights or other sources of ignition are prohibited near uncapped openings.

(10) No welding or cutting must be performed on an acetylene or oxygen pipeline, including the attachment of hangers or supports, until the line has been purged. Only oil-free air, oil-free nitrogen, or oil-free carbon dioxide must be used to purge oxygen lines.

[Recodified as § 296-307-48037. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48037, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48039 How must service piping systems be painted and marked? (1) Underground pipe and

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tubing and outdoor ferrous pipe and tubing must be covered or painted with a suitable material for protection against corrosion.

(2) Aboveground piping systems must be marked according to the American National Standard Scheme for the Identification of Piping Systems, ANSI A 13.1-1956.

(3) Station outlets must be marked to indicate the name of the gas.

[Recodified as § 296-307-48039. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48039, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48041 How must service piping systems be tested? (1) Piping systems must be tested and proved gastight at 1-1/2 times the maximum operating pressure, and must be thoroughly purged of air before being placed in service. The material used for testing oxygen lines must be oil free and noncombustible. Flames must not be used to detect leaks.

(2) When flammable gas lines or other parts of equipment are being purged of air or gas, sources of ignition are prohibited near uncapped openings.

[Recodified as § 296-307-48041. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48041, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48043 How must equipment be installed? Equipment shall be installed and used only in the service for which it is approved and as recommended by the manufacturer.

[Recodified as § 296-307-48043. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48043, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48045 How must service piping systems be protected? Service piping systems must be protected by pressure relief devices set to function at not more than the design pressure of the systems and discharging upwards to a safe location.

[Recodified as § 296-307-48045. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48045, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48047 What requirements apply to piping protective equipment? (1) The fuel-gas and oxygen piping systems, including portable outlet headers must incorporate the protective equipment shown in Figures V-1, V-2, and V-3.

When only a portion of a fuel-gas system is to be used with oxygen, only that portion must meet this requirement.

(2) Approved protective equipment (designated PF in Figs. V-1, V-2, and V-3) must be installed in fuel-gas piping to prevent:

(a) Backflow of oxygen into the fuel-gas supply system;
(b) Passage of a flash back into the fuel-gas supply system; and

(c) Excessive back pressure of oxygen in the fuel-gas supply system. The three functions of the protective equipment may be combined in one device or may be provided by separate devices.

[Title 296 WAC—p. 2645]

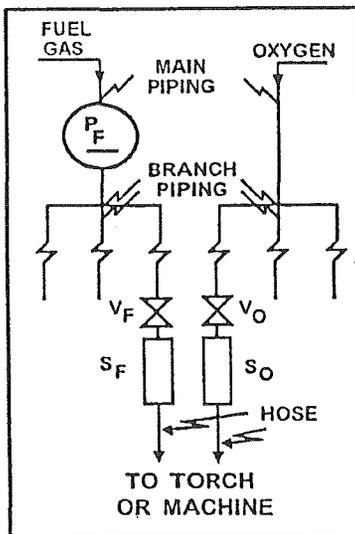


Fig. 1

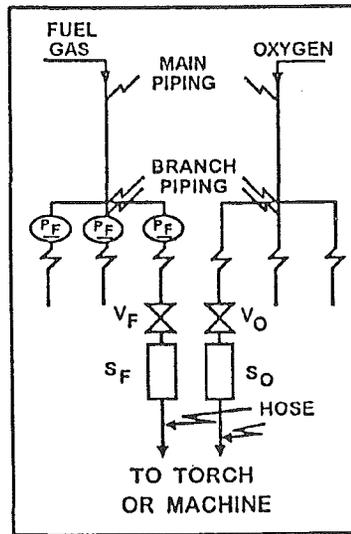


Fig. 2

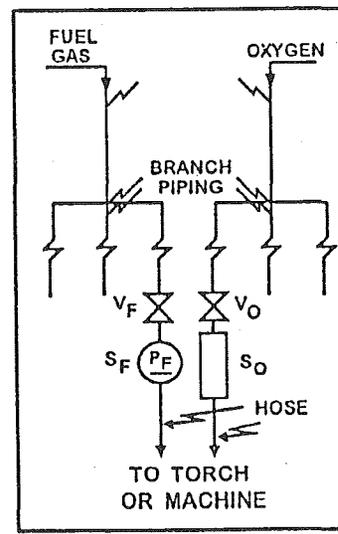


Fig. 3

PF = Protective equipment in fuel-gas piping

VF = Fuel-gas station outlet valve

VO = Oxygen station outlet valve

SF = Backflow prevention device(s) at fuel-gas station outlet

SO = Backflow prevention device(s) at oxygen station outlet

(3) The protective equipment must be located in the main supply line, as in Figure 1 or at the head of each branch line, as in Figure 2 or at each location where fuel-gas is withdrawn, as in Figure 3. Where branch lines are of 2-inch pipe size or larger or of substantial length, protective equipment (designated as PF) shall be located as shown in either 2 or 3.

(4) Backflow protection must be provided by an approved device that will prevent oxygen from flowing into the fuel-gas system or fuel from flowing into the oxygen system (see SF, Figs. 1 and 2).

(5) Flash-back protection must be provided by an approved device that will prevent flame from passing into the fuel-gas system.

(6) Back-pressure protection must be provided by an approved pressure-relief device set at a pressure not greater than the pressure rating of the backflow or the flashback protection device, whichever is lower. The pressure-relief device must be located on the downstream side of the backflow and flashback protection devices. The vent from the pressure-relief device must be at least as large as the relief device inlet and must be installed without low points that may collect moisture. If low points are unavoidable, drip pots with drains closed with screw plugs or caps shall be installed at the low points. The vent terminus must not endanger personnel or property through gas discharge; must be located away from ignition sources; and must terminate in a hood or bend.

(7) If pipeline protective equipment incorporates a liquid, the liquid level must be maintained, and a suitable anti-freeze may be used to prevent freezing.

(8) Fuel-gas for use with equipment not requiring oxygen must be withdrawn upstream of the piping protective devices.

[Recodified as § 296-307-48047, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48047, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48049 What requirements apply to station outlet protective equipment? (1) A check valve pressure regulator, hydraulic seal, or combination of these devices must be provided at each station outlet, including those on portable headers, to prevent backflow, as shown in Figures 1, 2, and 3 and designated as SF and SO.

(2) When approved pipeline protective equipment (designated PF) is located at the station outlet as in Figure 3, no additional check valve, pressure regulator, or hydraulic seal is required.

(3) Each station outlet must have a shut-off valve (designated VF and VO) installed on the upstream side of other station outlet equipment.

(4) If the station outlet is equipped with a detachable regulator, the outlet must terminate in a union connection that meets the requirements of the Regulator Connection Standards, 1958, Compressed Gas Association.

(5) If the station outlet is connected directly to a hose, the outlet must terminate in a union connection that meets the requirements of the Standard Hose Connection Specifications, 1957, Compressed Gas Association.

(6) Station outlets may terminate in pipe threads to which permanent connections are to be made, such as to a machine.

(7) Station outlets must have a detachable outlet seal cap secured in place. This cap must be used to seal the outlet except when a hose, a regulator, or piping is attached.

(8) Where station outlets are equipped with approved backflow and flashback protective devices, as many as four torches may be supplied from one station outlet through rigid piping, if each outlet from such piping, is equipped with a shut-off valve and if the fuel-gas capacity of any one torch does not exceed 15 cubic feet per hour. This rule does not apply to machines.

[Recodified as § 296-307-48049, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-

048, § 296-306A-48049, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48051 What requirements apply to hose and hose connections? (1) Hose for oxy-fuel gas service must meet the requirements of the Specification for Rubber Welding Hose, 1958, Compressed Gas Association and Rubber Manufacturers Association.

(2) The generally recognized colors are red for acetylene and other fuel-gas hose, green for oxygen hose, and black for inert-gas and air hose.

(3) When parallel lengths of oxygen and acetylene hose are taped together for convenience and to prevent tangling, a maximum of 4 inches out of 12 inches must be covered by tape.

(4) Hose connections must meet the requirements of the Standard Hose Connection Specifications, 1957, Compressed Gas Association.

(5) Hose connections must be clamped or otherwise securely fastened so they will withstand, without leakage, twice the pressure to which they are normally subjected in service, but never less than a pressure of 300 psi. Oil-free air or an oil-free inert gas must be used for the test.

(6) Hose showing leaks, burns, worn places, or other defects rendering it unfit for service must be repaired or replaced.

[Recodified as § 296-307-48051. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48051, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48053 What requirements apply to pressure-reducing regulators? (1) Pressure-reducing regulators must be used only for the gas and pressures for which they are intended. The regulator inlet connections must meet the requirements of the Regulator Connection Standards, 1958, Compressed Gas Association.

(2) When regulators or parts of regulators, including gauges, need repair, the work must be performed by skilled mechanics who have been properly instructed.

(3) Gauges on oxygen regulators must be marked "USE NO OIL."

(4) Union nuts and connections on regulators must be inspected before use to detect faulty seats that may cause leakage of gas when the regulators are attached to the cylinder valves. Damaged nuts or connections must be destroyed.

[Recodified as § 296-307-48053. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48053, filed 10/31/96, effective 12/1/96.]

WAC 296-307-485 Installation and operation of resistance welding equipment.

[Recodified as § 296-307-485. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-485, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48501 What general requirements apply to resistance welding equipment? (1) All equipment must be installed by a qualified electrician according to the requirements of chapter 296-307 WAC Part T. There must be a safety-type disconnecting switch or a circuit breaker or circuit interrupter to open each power circuit to the machine, conveniently located at or near the machine, so that the power can be shut off when the machine or its controls are to be serviced.

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(2) Ignitron tubes used in resistance welding equipment must have a thermal protection switch.

(3) Employees designated to operate resistance welding equipment must have been properly instructed and judged competent to operate such equipment.

(4) Controls of all automatic or air and hydraulic clamps must be arranged or guarded to prevent the operator from accidentally activating them.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-48501, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-48501. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48501, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48503 What requirements apply to portable welding machines? (1) All portable welding guns must have suitable counter-balanced devices for supporting the guns, including cables, unless the design of the gun or fixture makes counterbalancing impractical or unnecessary.

(2) All portable welding guns, transformers, and related equipment that is suspended from overhead structures, eye beams, or trolleys must have safety chains or cables. Safety chains or cables shall be able to support the total shock load in the event of failure of any component of the supporting system.

(3) When trolleys are used to support portable welding equipment, they must have suitable forged steel clevis for the attachment of safety chains. Each clevis must be able to support the total shock load of the suspended equipment in the event of trolley failure.

(4) All initiating switches, including retraction and dual schedule switches, located on the portable welding gun must have suitable guards able to prevent accidental initiation through contact with fixturing, operator's clothing, etc. Initiating switch voltage must be a maximum of 24 volts.

(5) The movable holder, where it enters the gun frame, must have enough clearance to prevent the shearing an operator's fingers if placed on the operating movable holder.

(6) The secondary and case of all portable welding transformers must be grounded. Secondary grounding may be by center tapped secondary or by a center tapped grounding reactor connected across the secondary.

[Recodified as § 296-307-48503. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-48503, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48505 What requirements apply to flash welding equipment? (1) Flash welding machines must have a hood to control flying flash. In cases of high production, where materials may contain a film of oil and where toxic elements and metal fumes are given off, ventilation must be provided according to WAC 296-307-50009 through 296-307-50029.

(2) For the protection of the operators of nearby equipment, fire-resistant curtains or suitable shields must be set up around the machine and in such a manner that the operator's movements are not hampered.

(3) If the welding process cannot be isolated, anyone who may be exposed to the hazard of arc flash must be properly protected.

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[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-48505, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-48505, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-48505, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48507 Who must perform a job hazard analysis? A qualified person must perform a job hazard analysis on the operations to be performed on each welding machine to determine the safeguards and personal protective equipment that shall be used for each job.

[Recodified as § 296-307-48507, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-48507, filed 10/31/96, effective 12/1/96.]

WAC 296-307-48509 What maintenance requirements apply to resistance welding equipment? Qualified maintenance personnel must periodically inspect the equipment and maintain records of the inspections. The operator must be instructed to report any equipment defects to the supervisor and the use of the equipment must be discontinued until safety repairs have been completed.

[Recodified as § 296-307-48509, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-48509, filed 10/31/96, effective 12/1/96.]

WAC 296-307-490 Application, installation, and operation of arc welding and cutting equipment.

[Recodified as § 296-307-490, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-490, filed 10/31/96, effective 12/1/96.]

WAC 296-307-49001 What environmental conditions must be taken into account when selecting arc welding equipment?

Note: You may ensure that your equipment is designed for safety by choosing equipment that complies with the Requirements for Electric Arc-Welding Apparatus, NEMA EW-1-1962, National Electrical Manufacturers Association or the Safety Standard for Transformer-Type Arc-Welding Machines, ANSI C33.2-1956, Underwriters' Laboratories.

(1) Standard machines for arc welding service must be designed and constructed to carry their rated load with rated temperature rises where the temperature of the cooling air is a maximum of 40°C (104°F) and where the altitude is a maximum of 3,300 feet, and must be suitable for operation in atmospheres containing gases, dust, and light rays produced by the welding arc.

(2) When exposed to the following or other conditions, machines must be designed to safely meet the requirements of the service.

- Unusually corrosive fumes;
- Steam or excessive humidity;
- Excessive oil vapor;
- Flammable gases;
- Abnormal vibration or shock;
- Excessive dust;
- Weather;
- Unusual seacoast or shipboard conditions.

[Recodified as § 296-307-49001, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-49001, filed 10/31/96, effective 12/1/96.]

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WAC 296-307-49003 What voltages must arc welding equipment use? Open circuit (no load) voltages of arc welding and cutting machines should be as low as possible consistent with satisfactory welding or cutting being done. Following are the maximum limits:

- (1) For alternating-current machines:
 - (a) Manual arc welding and cutting—80 volts.
 - (b) Automatic (machine or mechanized) arc welding and cutting—100 volts.
- (2) For direct-current machines:
 - (a) Manual arc welding and cutting—100 volts.
 - (b) Automatic (machine or mechanized) arc welding and cutting—100 volts.
- (3) When special welding and cutting processes require values of open circuit voltages higher than the above, means must be provided to prevent the operator from making accidental contact with the high voltage by adequate insulation or other means.

Note: For a.c. welding under wet conditions or warm surroundings where perspiration is a factor, the use of reliable automatic controls for reducing no load voltage is recommended to reduce the shock hazard.

[Recodified as § 296-307-49003, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-49003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-49005 How must arc welding equipment be designed? (1) A controller integrally mounted in an electric motor driven welder must be able to carry the rated motor current, must be able to make and interrupt stalled rotor current of the motor, and may serve as the running over-current device if provided with the number of over-current units as specified by chapter 296-307 WAC Part T. Starters with magnetic undervoltage release should be used with machines installed more than one to a circuit to prevent circuit overload caused by simultaneously starting several motors upon return of voltage.

(2) On all types of arc welding machines, control apparatus must be enclosed except for the operating wheels, levers, or handles.

Note: Control handles and wheels should be large enough to be easily grasped by a gloved hand.

(3) Input power terminals, tap change devices, and live metal parts connected to input circuits must be completely enclosed and accessible only by tools.

(4) Terminals for welding leads should be protected from accidental electrical contact by employees or by metal objects i.e., vehicles, crane hooks, etc. You may provide protection with:

- Dead-front receptacles for plug connections;
- Recessed openings with nonremovable hinged covers;
- Heavy insulating sleeving or taping; or
- Other equivalent electrical and mechanical protection.

If a welding lead terminal that is intended to be used exclusively for connection to the work is connected to the grounded enclosure, it must be done by a conductor at least two AWG sizes smaller than the grounding conductor and the terminal must be marked to indicate that it is grounded.

(5) No connections for portable control devices (such as push buttons to be carried by the operator) must be connected

to an a.c. circuit of higher than 120 volts. Exposed metal parts of portable control devices operating on circuits above 50 volts must be grounded by a grounding conductor in the control cable.

(6) Auto transformers or a.c. reactors must not be used to draw welding current directly from any a.c. power source having a voltage exceeding 80 volts.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-49005, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-49005. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-49005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-49007 How must arc welding equipment be installed? Arc welding equipment, including the power supply, must be installed according to the requirements of chapter 296-307 WAC Part T.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-49007, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-49007. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-49007, filed 10/31/96, effective 12/1/96.]

WAC 296-307-49009 How must arc welding equipment be grounded? (1) The frame or case of the welding machine (except engine-driven machines) must be grounded according to the requirements of chapter 296-307 WAC Part T.

(2) Conduits containing electrical conductors must not be used for completing a work-lead circuit. Pipelines must not be used as a permanent part of a work-lead circuit, but may be used during construction, extension or repair if current is not carried through threaded joints, flanged bolted joints, or caulked joints and special precautions are used to avoid sparking at connection of the work-lead cable.

(3) Using chains, wire ropes, cranes, hoists, and elevators to carry welding current is prohibited.

(4) Where a structure, conveyor, or fixture is regularly used as a welding current return circuit, joints must be bonded or provided with adequate current collecting devices and appropriate periodic inspection should be conducted to ensure that no electrocution, shock, or fire hazard exists.

(5) All ground connections must be checked to determine that they are mechanically strong and electrically adequate for the required current.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-49009, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-49009. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-49009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-49011 What requirements apply to supply connections and conductors? (1) A disconnecting switch or controller must be provided at or near each welding machine without a switch or controller mounted as an integral part of the machine. The switch must meet the requirements of chapter 296-307 WAC Part T. Overcurrent protection must be provided as specified in chapter 296-307 WAC Part T. A disconnect switch with overload protection or equivalent disconnect and protection means, permitted by chapter 296-307 WAC Part T must be provided for each outlet intended for connection to a portable welding machine.

(1999 Ed.)

(2) For individual welding machines, the rated current-carrying capacity of the supply conductors must be at least that of the rated primary current of the welding machines.

(3) For groups of welding machines, the rated current-carrying capacity of conductors may be less than the sum of the rated primary currents of the welding machines supplied. The conductor rating must be determined according to the machine loading based on the use to be made of each welding machine and the allowance permissible in the event that all the welding machines supplied by the conductors will not be in use at the same time.

(4) In operations involving several welders on one structure, d.c. welding process requirements may require the use of both polarities; or supply circuit limitations for a.c. welding may require distribution of machines among the phases of the supply circuit. In such cases, no load voltages between electrode holders will be two times normal in d.c. or 1, 1.4, 1.73, or 2 times normal on a.c. machines. Similar voltage differences will exist if both a.c. and d.c. welding are done on the same structure.

(a) All d.c. machines must be connected with the same polarity.

(b) All a.c. machines must be connected to the same phase of the supply circuit and with the same instantaneous polarity.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-49011, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-49011. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-49011, filed 10/31/96, effective 12/1/96.]

WAC 296-307-49013 How must arc welding equipment be operated? (1) Employees assigned to operate or maintain arc welding equipment must be acquainted with the requirements of WAC 296-307-490, 296-307-495, and 296-307-500; if doing gas-shielded arc welding, also Recommended Safe Practices for Gas-Shielded Arc Welding, A6.1-1966, American Welding Society.

(2) Before starting operations, all connections to the machine must be checked to make certain they are properly made. The work lead must be firmly attached to the work; magnetic work clamps shall be freed from adherent metal particles of spatter on contact surfaces. Coiled welding cable must be spread out before use to avoid serious overheating and damage to insulation.

(3) You must ensure that the welding machine frame grounding is checked with special attention given to safety ground connections of portable machines.

(4) Cylinders must be kept away from radiators, piping systems, layout tables, etc., that may be used for grounding electric circuits. Any practice such as the tapping of an electrode against a cylinder to strike an arc is prohibited.

(5) There must be no leaks of cooling water, shielding gas or engine fuel.

(6) You must ensure that the machine has proper switching equipment for shutting down.

(7) Printed rules and instructions covering operation of equipment supplied by the manufacturers must be strictly followed.

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(8) Electrode holders when not in use must be placed so that they cannot make electrical contact with persons, conducting objects, fuel or compressed gas tanks.

(9) Cables with splices within 10 feet of the holder are prohibited. The welder should not coil or loop welding electrode cable around parts of the body.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-49013, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-49013, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-49013, filed 10/31/96, effective 12/1/96.]

WAC 296-307-49015 How must arc welding equipment be maintained? (1) The operator should report any equipment defect or safety hazard to the supervisor and discontinue using the equipment until its safety is ensured. Repairs must be made only by qualified persons.

(2) Machines that have become wet must be thoroughly dried and tested before being used.

(3) Work and electrode lead cables should be frequently inspected for wear and damage. Cables with damaged insulation or exposed bare conductors must be replaced. Lengths of work and electrode cables must be joined by connecting means specifically intended for the purpose. The connecting means must have insulation adequate for the service conditions.

[Recodified as § 296-307-49015, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-49015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-495 Fire prevention and protection.

[Recodified as § 296-307-495, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-495, filed 10/31/96, effective 12/1/96.]

WAC 296-307-49501 What basic fire prevention precautions must be taken? For more information on these basic precautions and the special precautions of WAC 296-307-49503, including fire protection and prevention responsibilities of welders, cutters, their supervisors (including outside contractors), and management, see the Standard for Fire Prevention in Use of Cutting and Welding Processes, NFPA Standard 51B, 1962.

The basic precautions for fire prevention in welding or cutting work are:

(1) If the object to be welded or cut cannot readily be moved, all movable fire hazards in the vicinity must be taken to a safe place.

(2) If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards must be used to confine the heat, sparks, and slag, and to protect the fire hazards.

(3) If the requirements of this section cannot be met, then welding and cutting are prohibited.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-49501, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-49501, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-49501, filed 10/31/96, effective 12/1/96.]

WAC 296-307-49503 What special fire prevention precautions must be taken? When the nature of the work to

be performed falls within the scope of WAC 296-307-49501(2), certain additional precautions may be necessary:

(1) Wherever there are floor openings or cracks in the flooring that cannot be closed, precautions must be taken so that no readily combustible materials on the floor below will be exposed to sparks that drop through. The same precautions must be observed with regard to cracks or holes in walls, open doorways, and open or broken windows.

(2) Suitable fire extinguishing equipment must be maintained in a state of readiness for instant use. Such equipment may consist of pails of water, buckets of sand, hose, or portable extinguishers depending upon the nature and quantity of the combustible material exposed.

(3) The following requirements apply to fire watch:

(a) Fire watchers are required whenever welding or cutting is performed in locations where other than a minor fire might develop, or any of the following conditions exist:

(i) Appreciable combustible material, in building construction or contents, closer than 35 feet to the point of operation.

(ii) Appreciable combustibles are more than 35 feet away but are easily ignited by sparks.

(iii) Wall or floor openings within a 35-foot radius expose combustible material in adjacent areas including concealed spaces in walls or floors.

(iv) Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.

(b) Fire watchers must have fire extinguishing equipment readily available and be trained in its use. They must be familiar with facilities for sounding an alarm in the event of a fire. They must watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm. A fire watch must be maintained for at least a half hour after completion of welding or cutting operations to detect and extinguish possible smoldering fires.

(4) Before cutting or welding is permitted, the area must be inspected by the individual responsible for authorizing cutting and welding operations. The responsible individual must designate precautions to be followed in granting authorization to proceed, preferably in the form of a written permit.

(5) Where combustible materials such as paper clippings, wood shavings, or textile fibers are on the floor, the floor must be swept clean for a radius of 35 feet. Combustible floors must be kept wet, covered with damp sand, or protected by fire-resistant shields. Where floors have been wet down, employees operating arc welding or cutting equipment must be protected from possible shock.

(6) Cutting and welding are prohibited in the following situations:

(a) In areas not authorized by management.

(b) In sprinklered buildings while such protection is impaired.

(c) In the presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dusts with air), or where explosive atmospheres may develop inside uncleaned or improperly prepared tanks or equipment that have previously contained such materials, or that may develop in areas with an accumulation of combustible dusts.

(d) In areas near the storage of large quantities of exposed, readily ignitable materials such as bulk sulphur, baled paper, or cotton.

(7) Where practical, all combustibles must be relocated at least 35 feet from the worksite. Where relocation is impractical, combustibles must be protected with flame-proofed covers or otherwise shielded with metal or asbestos guards or curtains. Edges of covers at the floor should be tight to prevent sparks from going under them. This precaution is also important at overlaps where several covers are used to protect a large pile.

(8) Ducts and conveyor systems that might carry sparks to distant combustibles must be suitably protected or shut down.

(9) Where cutting or welding is done near walls, partitions, ceiling, or roof of combustible construction, fire-resistant shields or guards must be provided to prevent ignition.

(10) If welding is to be done on a metal wall, partition, ceiling, or roof, precautions must be taken to prevent ignition of combustibles on the other side, due to conduction or radiation, preferably by relocating combustibles. Where combustibles are not relocated, a fire watch on the opposite side from the work must be provided.

(11) Welding must not be attempted on a metal partition, wall, ceiling, or roof having a combustible covering nor on walls or partitions of combustible sandwich-type panel construction.

(12) Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings or roofs must not be undertaken if the work is close enough to cause ignition by conduction.

(13) You are responsible for the safe use of cutting and welding equipment on your property and:

(a) Based on fire potentials of plant facilities, you must establish areas and procedures for cutting and welding;

(b) You must designate an individual responsible for authorizing cutting and welding operations in areas not specifically designed for such processes;

(c) You must insist that cutters or welders and their supervisors are suitably trained in the safe operation of their equipment and the safe use of the process; and

(d) You must advise all contractors about flammable materials or hazardous conditions of which they may not be aware.

(14) The supervisor must:

(a) Ensure that cutting and welding equipment is handled and used safely.

(b) Determine the combustible materials and hazardous areas present or likely to be present in the work location.

(c) Protect combustibles from ignition by the following:

(i) Have the work moved to a location free from dangerous combustibles;

(ii) If the work cannot be moved, have the combustibles moved to a safe distance from the work or have the combustibles properly shielded against ignition; and

(iii) See that cutting and welding are so scheduled that plant operations that might expose combustibles to ignition are not started during cutting or welding.

(d) Secure authorization for the cutting or welding operations from the designated management representative.

(e) Determine that the cutter or welder secures their approval that conditions are safe before going ahead;

(f) Determine that fire protection and extinguishing equipment are properly located at the site; and

(g) Ensure fire watches are available at the site when required.

(15) Cutting or welding is permitted only in areas that are or have been made fire safe. Within the confines of an operating plant or building, cutting and welding should preferably be done in a specific area designed for such work, such as a maintenance shop or a detached outside location. Such areas should be of noncombustible or fire-resistive construction, essentially free of combustible and flammable contents, and suitably segregated from adjacent areas. When work cannot be moved practically, as in most construction work, the area must be made safe by removing combustibles or protecting combustibles from ignition sources.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-49503, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-49503, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-49503, filed 10/31/96, effective 12/1/96.]

WAC 296-307-49505 What precautions must be taken when welding or cutting containers? (1) No welding, cutting, or other hot work may be performed on used drums, barrels, tanks or other containers until they have been cleaned thoroughly enough to be certain that there are no flammable materials present or any substances such as greases, tars, acids, or other materials which when subjected to heat, might produce flammable or toxic vapors. Any pipe lines or connections to the drum or vessel must be disconnected or blanked.

(2) All hollow spaces, cavities, or containers must be vented to permit the escape of air or gases before preheating, cutting or welding. Purging with inert gas is recommended.

[Recodified as § 296-307-49505, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-49505, filed 10/31/96, effective 12/1/96.]

WAC 296-307-49507 What precautions must be taken when welding in confined spaces? (1) When arc welding work is stopped for a substantial time, such as during lunch or overnight, all electrodes must be removed from the holders and the holders carefully located so that accidental contact cannot occur and the machine be disconnected from the power source.

(2) In order to eliminate the possibility of gas escaping through leaks or improperly closed valves, when gas welding or cutting, the torch valves must be closed and the gas supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period of time, such as during lunch hour or overnight. Where practical, the torch and hose must also be removed from the confined space.

[Recodified as § 296-307-49507, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-49507, filed 10/31/96, effective 12/1/96.]

WAC 296-307-500 Protection of employees.

[Recodified as § 296-307-500. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-500, filed 10/31/96, effective 12/1/96.]

WAC 296-307-50001 How must eye protection be selected? (1) Helmets or hand shields must be used during all arc welding or arc cutting operations, excluding submerged arc welding. Goggles should also be worn during arc welding or cutting operations to provide protection from injurious rays from adjacent work, and from flying objects. The goggles may have either clear or colored glass, depending on the amount of exposure to adjacent welding operations. Helpers or attendants must have proper eye protection.

(2) Goggles or other suitable eye protection must be used during all gas welding or oxygen cutting operations. Spectacles without side shields, with suitable filter lenses are permitted for use during gas welding operations on light work, for torch brazing, or for inspection.

(3) All operators and attendants of resistance welding or resistance brazing equipment must use transparent face shields or goggles, depending on the job, to protect their faces or eyes as required.

(4) Suitable goggles must be provided where needed for brazing operations not above.

[Recodified as § 296-307-50001. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50001, filed 10/31/96, effective 12/1/96.]

WAC 296-307-50003 What specifications must eye protection meet? (1) Helmets and hand shields must be made of a material that is an insulator for heat and electricity. Helmets, shields and goggles must be not readily flammable and must be able to be sterilized.

(2) Helmets and hand shields must be arranged to protect the face, neck and ears from direct radiant energy from the arc.

(3) Helmets must have filter plates and cover plates designed for easy removal.

(4) All parts must be constructed of a material that will not readily corrode or discolor the skin.

(5) Goggles must be ventilated to prevent fogging of the lenses as much as practical.

(6) Cover lenses or plates should be provided to protect each helmet, hand shield, or goggle filter lens or plate.

(7) All glass for lenses must be tempered, substantially free from scratches, air bubbles, waves and other flaws. Except when a lens is ground to provide proper optical correction for defective vision, the front and rear surfaces of lenses and windows must be smooth and parallel.

(8) Lenses must be marked with the source and shade.

(9) Following is a guide to select proper shade numbers. Individual needs may vary.

Welding Operation	Shade No.
Shielded metal-arc welding—1/16-, 3/32-, 1/8-, 5/32-inch electrodes	10
Gas-shielded arc welding (nonferrous)—1/16-, 3/32-, 1/8-, 5/32-inch electrodes	11
Gas-shielded arc welding (ferrous)—1/16-, 3/32-, 1/8-, 5/32-inch electrodes	12

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Welding Operation	Shade No.
Shielded metal-arc welding: 3/16-, 7/32-, 1/4-inch electrodes	12
5/16-, 3/8-inch electrodes	14
Atomic hydrogen welding	10-14
Carbon arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1 inch to 6 inches	4 or 5
Heavy cutting, 6 inches and over	5 or 6
Gas welding (light) up to 1/8 inch	4 or 5
Gas welding (medium) 1/8 inch to 1/2 inch	5 or 6
Gas welding (heavy) 1/2 inch and over	6 or 8

Note: In gas welding or oxygen cutting where the torch produces a high yellow light it is desirable to use a filter or lens that absorbs the yellow or sodium line in the visible light of the operation.

(10) All filter lenses and plates must meet the test for transmission of radiant energy prescribed in ANSI Z 87.1-1968—American National Standard Practice for Occupational and Educational Eye and Face Protection.

(11) Where the work permits, an arc welder should be enclosed in an individual booth painted with a finish of low-reflectivity such as zinc oxide (an important factor for absorbing ultraviolet radiations) and lamp black, or must be enclosed with noncombustible screens similarly painted. Booths and screens must permit circulation of air at floor level. Employees or other persons adjacent to the welding areas must be protected from the rays by noncombustible or flameproof screens or shields or must be required to wear appropriate goggles.

[Recodified as § 296-307-50003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-50005 What protective clothing must welders wear? (1) Employees exposed to the hazards created by welding, cutting, or brazing operations must be protected by personal protective equipment according to the requirements of chapter 296-307 WAC Part H. Appropriate protective clothing required for any welding operation will vary with the size, nature and location of the work to be performed.

(2) The following suggestions may be helpful when choosing protective clothing:

(a) Except when engaged in light work, all welders should wear flameproof gauntlet gloves.

(b) Flameproof aprons made of leather, asbestos, or other suitable material may help to protect against radiated heat and sparks.

(c) Woolen clothing is better than cotton because it is less easily ignited and helps to protect the welder from changes in temperature. Cotton clothing, if used, should be chemically treated to reduce its combustibility. All outer clothing such as jumpers or overalls should be reasonably free from oil or grease.

(d) Sparks may lodge in rolled-up sleeves, pockets, or cuffs. Therefore sleeves and collars should be buttoned, and clothing should have no front pockets. Trousers or overalls should be uncuffed.

(e) For heavy work, fire-resistant leggings, high boots, or other equivalent means should be used.

(f) In production work a sheet metal screen in front of the employee's legs can provide further protection against sparks and molten metal in cutting operations.

(g) Capes or shoulder covers made of leather or other suitable materials should be worn during overhead welding or cutting operations. Leather skull caps may be worn under helmets to prevent head burns.

(h) For welding and cutting overhead or in extremely confined spaces, ear protection is sometimes desirable.

(i) Where there is exposure to sharp or heavy falling objects, or a hazard of bumping in confined spaces, hard hats or head protectors must be used.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-50005, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-50005, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-50005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-50007 What other requirements apply to employee protection? (1) You must ensure that a welder or helper working on platforms, scaffolds, or runways is protected against falling by using railings, safety belts, life lines, or other equally effective safeguards.

(2) Welders must place welding cable and other equipment so that it is clear of passageways, ladders, and stairways.

[Recodified as § 296-307-50007, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-50007, filed 10/31/96, effective 12/1/96.]

WAC 296-307-50009 What employee protection must be provided in confined spaces? "Confined space" means a relatively small or restricted space such as a tank, boiler, pressure vessel, or small compartment of a ship.

(1) Confined spaces must be ventilated. For ventilation requirements see WAC 296-307-50011 through 296-307-50029.

(2) When welding or cutting in a confined space, the gas cylinders and welding machines must be left outside. Before operations are started, heavy portable equipment mounted on wheels must be securely blocked to prevent accidental movement.

(3) Where a welder must enter a confined space through a manhole or other small opening, means must be provided for quickly removing the welder in case of emergency. When safety belts and lifelines are used, they must be attached so that the welder's body cannot be jammed in a small exit opening. An attendant with a preplanned rescue procedure must be stationed outside to observe the welder at all times and be able to put rescue operations into effect.

(4) After welding operations are completed, the welder must mark the hot metal or provide some other means of warning other employees.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-50009, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-50009, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-50009, filed 10/31/96, effective 12/1/96.]

(1999 Ed.)

WAC 296-307-50011 What general requirements apply to welding ventilation? (1) The following three factors in arc and gas welding must be considered when determining the amount of contamination to which welders may be exposed:

(a) Dimensions of space in which welding is to be done (especially ceiling height);

(b) Number of welders; and

(c) The possibility of hazardous fumes, gases, or dust according to the metals involved.

(2) Other factors involved may require ventilation or respiratory protective devices as needed to meet the requirements of this section. Such factors include:

(a) Atmospheric conditions;

(b) Heat generated; and

(c) Presence of volatile solvents.

(3) When welding must be performed in a space entirely screened on all sides, the screens must be arranged so that no serious restriction of ventilation exists. The screens should be mounted so that they are about 2 feet above the floor unless the work is performed at so low a level that the screen must be extended nearer to the floor to protect nearby employees from the glare of welding.

(4) Local exhaust or general ventilating systems must be provided and arranged to keep the amount of toxic fumes, gases, or dusts below the maximum allowable in chapter 296-62 WAC.

Note: A number of potentially hazardous materials are employed in fluxes, coatings, coverings, and filler metals used in welding and cutting or are released to the atmosphere during welding and cutting. These include but are not limited to the materials itemized in WAC 296-307-50019 through 296-307-50029.

(5) You must determine which potentially hazardous materials are associated with welding and cutting and inform employees through signs, labels or other appropriate means.

(a) Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. Use adequate ventilation. See ANSI Z 49.1-1967, Safety in Welding and Cutting, published by the American Welding Society.

(b) Brazing (welding) filler metals containing cadmium in significant amounts must carry the following notice on tags, boxes, or other containers:

WARNING

CONTAINS CADMIUM—POISONOUS FUMES MAY BE FORMED ON HEATING

• Do not breathe fumes. Use only with adequate ventilation such as fume collectors, exhaust ventilators, or air-supplied respirators. See ANSI Z 49.1-1967.

• If chest pain, cough, or fever develops after use call physician immediately.

• Keep children away when using.

(c) Brazing and gas welding fluxes containing fluorine compounds must have a cautionary wording to indicate that they contain fluorine compounds. The American Welding Society recommends the following for brazing and gas welding fluxes:

CAUTION
CONTAINS FLUORIDES

This flux when heated gives off fumes that may irritate eyes, nose and throat.

- Avoid fumes. Use only in well-ventilated spaces.
- Avoid contact of flux with eyes or skin.
- Do not take internally.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-50011, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-50011, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-50011, filed 10/31/96, effective 12/1/96.]

WAC 296-307-50013 What ventilation must be provided for general welding and cutting? (1) Mechanical ventilation must be provided when welding or cutting is done on metals not covered in WAC 296-307-50019 through 296-307-50029 in the following locations:

- (a) In a space of less than 10,000 cubic feet per welder.
- (b) In a room with a ceiling height of less than 16 feet.
- (c) In confined spaces or where the welding space contains partitions, balconies, or other structural barriers to the extent that they significantly obstruct cross-ventilation.

(2) Ventilation must be at the minimum rate of 2,000 cubic feet per minute per welder.

Exception: This requirement does not apply where local exhaust hoods and booths that meet the requirements of WAC 296-307-50015, or airline respirators approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for such purposes are provided. Natural ventilation is considered sufficient for welding or cutting operations where the restrictions in subsection (1) of this section are not present.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-50013, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-50013, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-50013, filed 10/31/96, effective 12/1/96.]

WAC 296-307-50015 What requirements apply to local exhaust hoods and booths? Mechanical local exhaust ventilation may be provided by either of the following:

(1) Freely movable hoods intended to be placed by the welder as near as practical to the work being welded and provided with a rate of airflow sufficient to maintain a velocity in the direction of the hood of 100 linear feet per minute in the zone of welding when the hood is at its most remote distance from the point of welding. The rates of ventilation required to accomplish this control velocity using a 3-inch wide flanged suction opening are shown in the following table:

Welding zone	Minimum air flow cubic feet/minutes	Duct diameter inches
4 to 6 inches from arc or torch	150	3
6 to 8 inches from arc or torch	275	3-1/2
8 to 10 inches from arc or torch	425	4-1/2

[Title 296 WAC—p. 2654]

10 to 12 inches from arc or torch 600 5-1/2

- 1 When brazing with cadmium bearing materials or when cutting on such materials increased rates of ventilation may be required.
- 2 Nearest half-inch duct diameter based on 4,000 feet per minute velocity in pipe.

(2) A fixed enclosure with a top and at least two sides that surround the welding or cutting operations and with a rate of airflow sufficient to maintain a velocity away from the welder of not less than 100 linear feet per minute.

[Recodified as § 296-307-50015, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-50015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-50017 What ventilation must be provided in confined spaces? (1) All welding and cutting operations carried on in confined spaces must be adequately ventilated to prevent the accumulation of toxic materials or possible oxygen deficiency. This applies to welders, helpers, and other employees in the immediate vicinity. All replacement air must be clean and respirable.

(2) In circumstances where it is impossible to provide such ventilation, airline respirators or hose masks approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for this purpose must be used.

(3) In areas immediately hazardous to life, hose masks with blowers or self-contained breathing equipment must be used. The breathing equipment must be approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH).

(4) Where welding operations are carried on in confined spaces and where welders and helpers are provided with hose masks, hose masks with blowers or self-contained breathing equipment approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH), an employee must be stationed on the outside of such confined spaces to ensure the safety of those working within.

(5) Oxygen must not be used for ventilation.

[Recodified as § 296-307-50017, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-50017, filed 10/31/96, effective 12/1/96.]

WAC 296-307-50019 What requirements apply to welding fluorine compounds? In confined spaces, welding or cutting involving fluxes, coverings, or other materials that contain fluorine compounds must be done according to WAC 296-307-50017.

"Fluorine compound" means a compound that contains fluorine as an element in chemical combination, not as a free gas.

Note: The need for local exhaust ventilation or airline respirators for welding or cutting in other than confined spaces will depend on the circumstances. However, such protection is desirable for fixed-location production welding and for all production welding on stainless steels. Where air samples taken at the welding location indicate that the fluorides liberated are below the maximum allowable concentration, such protection is not necessary.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-50019, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-50019. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50019, filed 10/31/96, effective 12/1/96.]

WAC 296-307-50021 What requirements apply to welding zinc? (1) In confined spaces welding or cutting involving zinc-bearing base or filler metals or metals coated with zinc-bearing materials must be done according to WAC 296-307-50017.

(2) Indoors, welding or cutting involving zinc-bearing base or filler metals coated with zinc-bearing materials must be done according to WAC 296-307-50015.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-50021, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-50021. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50021, filed 10/31/96, effective 12/1/96.]

WAC 296-307-50023 What requirements apply to welding lead? (1) In confined spaces, welding involving lead-base metals (erroneously called lead-burning) must be done according to WAC 296-307-50017.

(2) Indoors, welding involving lead-base metals must be done according to WAC 296-307-50015.

(3) In confined spaces or indoors, welding or cutting involving metals containing lead, other than as an impurity, or involving metals coated with lead-bearing materials, including paint, must be done using local exhaust ventilation or airline respirators. Outdoors, such operations must be done using respiratory protective equipment approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for such purposes. In all cases, employees in the immediate vicinity of the cutting operation must be protected as necessary by local exhaust ventilation or airline respirators.

Note: See chapter 296-62 WAC for additional requirements on lead.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-50023, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-50023. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50023, filed 10/31/96, effective 12/1/96.]

WAC 296-307-50025 What requirements apply to welding beryllium? Welding or cutting indoors, outdoors, or in confined spaces involving beryllium-containing base or filler metals must be done using local exhaust ventilation and airline respirators unless atmospheric tests under the most adverse conditions have established that employee exposure is within the acceptable concentrations defined by chapter 296-62 WAC. In all cases, employees in the immediate vicinity of the welding or cutting operations must be protected as necessary by local exhaust ventilation or airline respirators.

[Recodified as § 296-307-50025. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50025, filed 10/31/96, effective 12/1/96.]

WAC 296-307-50027 What requirements apply to welding cadmium? (1) Welding or cutting indoors or in confined spaces involving cadmium-bearing or cadmium-coated base metals must be done using local exhaust ventilation or

airline respirators unless atmospheric tests under the most adverse conditions have established that employee exposure is within the acceptable concentrations defined by chapter 296-62 WAC. Outdoors, such operations must be done using respiratory protective equipment such as fume respirators approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for such purposes.

(2) Welding (brazing) involving cadmium-bearing filler metals must be done using ventilation as prescribed in WAC 296-307-50015 or 296-307-50017 if the work is to be done in a confined space.

Note: See chapter 296-62 WAC for additional requirements on cadmium.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-50027, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-50027. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50027, filed 10/31/96, effective 12/1/96.]

WAC 296-307-50029 What requirements apply to welding mercury? Welding or cutting indoors or in a confined space involving metals coated with mercury-bearing materials, including paint, must be done using local exhaust ventilation or airline respirators unless atmospheric tests under the most adverse conditions have established that employee exposure is within the acceptable concentrations defined by chapter 296-62 WAC. Outdoors, such operations must be done using respiratory protective equipment approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for such purposes.

[Recodified as § 296-307-50029. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-50029, filed 10/31/96, effective 12/1/96.]

Part W

Powered Industrial Trucks (Forklifts)

WAC 296-307-520 Powered industrial trucks (forklifts).

[Recodified as § 296-307-520. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-520, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52001 What does this section cover? WAC 296-307-520 applies to all powered industrial trucks used in agricultural operations.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-52001, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-52001. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52001, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52003 What is a "powered industrial truck"? "Powered industrial truck" (or "truck") means a fork truck, industrial tractor, platform lift truck, motorized hand truck, or other specialized industrial trucks, powered by electric motors or internal combustion engines. The definition does not include compressed gas-operated industrial trucks, tractor-mounted forklifts, or vehicles intended primarily for earth moving or over-the-road hauling.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-52003, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-52003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52005 What manufacturer's requirements apply to powered industrial trucks? (1) All powered industrial trucks must meet the design and construction requirements for powered industrial trucks established in the ANSI B56.1-1969, "Powered Industrial Trucks."

(2) Approved trucks must have a label indicating approval by the testing laboratory as meeting the specifications and requirements of ANSI B56.1-1969.

(3) Modifications or additions must only be performed with the manufacturer's prior written approval. When modifications or additions are made, capacity, operation, and maintenance instruction plates, tags, or decals must be changed accordingly.

(4) If the truck is equipped with front-end attachments other than factory installed attachments, it must be marked to identify the attachments and show the approximate weight of the truck and attachment combination at maximum elevation with the load centered from side to side.

(5) The user must ensure that all nameplates and markings are in place and legible.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-52005, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-52005. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52007 What are the classifications of powered industrial trucks? Powered industrial trucks are identified according to the following classifications:

(1) "D" units are similar to G units except that they are diesel engine powered instead of gasoline engine powered.

(2) "DS" units are diesel powered units with additional safeguards to the exhaust, fuel, and electrical systems. They may be used in some locations where a D unit may not be considered suitable.

(3) "DY" units are diesel powered units that have all the safeguards of the DS units; in addition, they do not have any electrical equipment, including the ignition, and are equipped with temperature limitation features.

(4) "E" units are electrically powered units with minimum acceptable safeguards against inherent fire hazards.

(5) "ES" units are electrically powered units that, in addition to all of the requirements for the E units, are provided with additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface temperatures. They may be used in some locations where the use of an E unit may not be considered suitable.

(6) "EE" units are electrically powered units that have, in addition to all of the requirements for the ES units, electric motors and all other electrical equipment completely enclosed. The EE unit may be used where the use of an E or ES unit may not be considered suitable.

(7) "EX" units are electrically powered units that differ from E, ES, or EE units in that the electrical fittings and equipment are so designed, constructed, and assembled that

the units may be used in certain atmospheres containing flammable vapors or dusts.

(8) "G" units are gasoline powered units having minimum acceptable safeguards against inherent fire hazards.

(9) "GS" units are gasoline powered units with additional safeguards to the exhaust, fuel, and electrical systems. They may be used in some locations where the use of a G unit may not be considered suitable.

(10) "LP" units are similar to G units except that LP-gas is used for fuel instead of gasoline.

(11) "LPS" units are LP-gas powered units with additional safeguards to the exhaust, fuel, and electrical systems. They may be used in some locations where the use of an LP unit may not be considered suitable.

[Recodified as § 296-307-52007. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52007, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52009 What must a user consider before choosing a powered industrial truck? Before choosing the industrial truck to use, the user must determine whether the atmosphere or location is hazardous or nonhazardous. The type of industrial truck must be chosen according to the requirements of WAC 296-307-52011.

[Statutory Authority: RCW 49.17.040. 98-24-096, § 296-307-52009, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-52009. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52011 What requirements determine which trucks to use in specific hazardous environments? Following are the minimum truck types required in specific hazardous environments. You may choose to use industrial trucks having greater safeguards.

(1) Powered industrial trucks are prohibited in atmospheres with a hazardous concentration of acetylene, butadiene, ethylene oxide, hydrogen (or gases or vapors equivalent in hazard to hydrogen, such as manufactured gas), propylene oxide, acetaldehyde, cyclopropane, diethyl ether, ethylene, isoprene, or unsymmetrical dimethyl hydrazine (UDMH).

(a) Approved EX trucks must be used in atmospheres containing hazardous concentrations of metal dust, including aluminum, magnesium, and their commercial alloys; other metals of similarly hazardous characteristics; or in atmospheres containing carbon black, coal, or coke dust.

(b) In atmospheres where dust of magnesium, aluminum or aluminum bronze may be present, fuses, switches, motor controllers, and circuit breakers of trucks must have enclosures specifically approved for such locations.

(2) Approved EX trucks must be used in atmospheres containing acetone, acrylonitrile, alcohol, ammonia, benzene, benzol, butane, ethylene dichloride, gasoline, hexane, lacquer solvent vapors, naphtha, natural gas, propane, propylene, styrene, vinyl acetate, vinyl chloride, or xylenes in quantities sufficient to produce explosive or ignitable mixtures.

(3) Approved DY, EE, or EX trucks must be used in locations where volatile flammable liquids or flammable gases are handled, processed or used, if the hazardous liquids, vapors or gases are normally confined within closed containers or closed systems from which they can escape only in

case of accidental rupture or breakdown, or in case of abnormal equipment operation.

Approved DY, EE, or EX trucks may also be used in locations in which hazardous concentrations of gases or vapors are normally prevented by mechanical ventilation but that might become hazardous through failure or abnormal operation of the ventilating equipment.

(4) Approved DS, ES, GS, or LPS trucks must be used in locations used for the storage of hazardous liquids in sealed containers or liquefied or compressed gases in containers. This classification includes locations where volatile flammable liquids or flammable gases or vapors are used but are hazardous only in case of an accident or an unusual operation condition.

The quantity of hazardous material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the business's history of explosions or fires are all factors that should be considered in determining which truck has sufficient safeguards for the location.

(a) Approved EX trucks must be used in atmospheres in which combustible dust is or may be suspended in quantities sufficient to produce explosive or ignitable mixtures, or where mechanical failure or abnormal operation of machinery or equipment might cause such mixtures to be produced.

(b) The EX classification usually includes the working areas of: Grain handling and storage plants, rooms containing grinders or pulverizers, cleaners, graders, scalpels, open conveyors or spouts, open bins or hoppers, mixers or blenders, automatic or hopper scales, packing machinery, elevator heads and boots, stock distributors, dust and stock collectors (except all-metal collectors vented to the outside), and all similar dust producing machinery and equipment in grain processing plants, starch plants, sugar pulverizing plants, malting plants, hay grinding plants, and other similar locations; and areas where combustible dust may, under normal operating conditions, be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

(5) Approved DY, EE, or EX trucks must be used in atmospheres in which deposits or accumulations of combustible dust may be ignited by arcs or sparks from the truck, if combustible dust will not normally be suspended or thrown into suspension by the normal operation of equipment or apparatus in quantities sufficient to produce explosive or ignitable mixtures.

(6) Approved DY, EE, or EX trucks must be used in locations with easily ignitable fibers or flyings if the fibers or flyings are not likely to be suspended in quantities sufficient to produce ignitable mixtures.

(7) Approved DS, DY, ES, EE, EX, GS, or LPS trucks must be used in locations, including outside storage, where easily ignitable fibers are stored or handled, but are not processed or manufactured. E trucks that have been previously used in these locations may continue to be used.

(8) If storage warehouses and outside storage locations are hazardous, the specified approved truck must be used. If not classified as hazardous, any approved D, E, G, or LP truck may be used, or trucks meeting the requirements for these types may be used.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-52011, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-52011. 97-09-013, filed

(1999 Ed.)

4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52011, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52013 In what environments may converted trucks be used? When powered industrial trucks that were originally approved to use gasoline are converted to use LP-gas according to WAC 296-307-52047(12), they may be used in locations where G, GS or LP, and LPS trucks are specified.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-52013, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-52013. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52013, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52015 What requirements apply to overhead safety guards? (1) High-lift rider trucks must be fitted with an overhead guard manufactured according to WAC 296-307-52005(1), unless operating conditions do not permit.

(2) An overhead guard must be used as protection against falling objects.

Note: An overhead guard is intended to offer protection from the impact of small packages, boxes, bagged material, and other objects involved in the job, but not to withstand the impact of a falling capacity load.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-52015, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-52015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52017 What requirements apply to load backrests? (1) A load backrest extension must be used whenever necessary to minimize the possibility of the load or part of it from falling rearward.

(2) If the type of load presents a hazard, the user must equip fork trucks with a vertical load backrest extension manufactured according to WAC 296-307-52005(1).

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-52017, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-52017. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52017, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52019 What requirements apply to fuel handling and storage? (1) You must ensure that liquid fuels such as gasoline and diesel fuel are stored and handled according to NFPA Flammable and Combustible Liquids Code (NFPA No. 30-1969).

(2) You must ensure that LP-gas fuel is stored and handled according to NFPA Storage and Handling of Liquefied Petroleum Gases (NFPA No. 58-1969).

[Recodified as § 296-307-52019. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52019, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52021 What requirements apply to lighting for operating areas? (1) Adequate lighting should be provided in operating areas. (See ANSI Practice for Industrial Lighting, All.1-1965 (R1970).)

(2) Where general lighting is inadequate, directional lighting must be provided on the truck.

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[Recodified as § 296-307-52021. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52021, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52023 What level of carbon monoxide gas is allowed? Concentration levels of carbon monoxide gas created by truck operations must not exceed the levels specified in WAC 296-62-075 (general occupational health standards).

Note: Questions concerning degree of concentration and methods of sampling should be referred to a qualified industrial hygienist.

[Recodified as § 296-307-52023. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52023, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52025 What requirements apply to dockboards (bridge plates)? (1) Portable and powered dockboards must be strong enough to support the load carried on them.

(2) Portable dockboards must be secured in position, either by anchors or anti-slipping devices.

(3) Powered dockboards must meet the design and construction requirements of Commercial Standard CS202-56 (1956) "Industrial Lifts and Hinged Loading Ramps" published by the U.S. Department of Commerce.

(4) Dockboard or bridge plates must be driven over carefully and slowly and their rated capacity never exceeded.

(5) Portable dockboards must have handholds for safe handling.

(6) Railroad cars must be kept stationary while dockboards or bridge plates are in position.

[Recodified as § 296-307-52025. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52025, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52027 What rules apply to loading trucks, trailers, and railroad cars with powered industrial trucks? (1) Wheel stops or other positive protection must be provided to prevent railroad cars from moving during loading or unloading.

(2) Fixed jacks may be necessary to support a semi-trailer and prevent up-ending during loading or unloading if the trailer is not coupled to a tractor.

(3) Many truck-trailers are equipped with a rear-end protection device to prevent cars from wedging underneath during a collision. These protection devices must be used with equipment that secures the truck-trailer to the loading dock. Wheel chocks are not required under the following conditions:

(a) Trucks or trailers are secured to the loading dock with a mechanical system that prevents movement away from the dock during loading, unloading, and boarding.

(b) All of the mechanical equipment is installed, maintained, and used as recommended by the manufacturer.

(c) Any damaged mechanical equipment is removed from service immediately and is not used to secure trucks and trailers.

(4) The flooring of trucks, trailers, and railroad cars must be checked for breaks and weakness before use.

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[Recodified as § 296-307-52027. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52027, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52029 Who may operate powered industrial trucks? You must only allow trained and authorized operators to operate powered industrial trucks. You must provide training in the safe operation of powered industrial trucks to employee-operators.

[Recodified as § 296-307-52-52029. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52029, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52031 What requirements apply to operating powered industrial trucks? (1) No operator may drive a truck up to anyone standing in front of a fixed object.

(2) No one may stand or pass under the elevated portion of any truck, whether loaded or empty.

(3) Only authorized personnel may ride on powered industrial trucks. The truck must have a safe place to ride when riding is authorized.

(4) You must prohibit employees from placing their arms or legs between the uprights of the mast or outside the running lines of the truck.

(5) When an operator leaves a powered industrial truck unattended:

(a) The load must be fully lowered;

(b) The controls must be neutralized;

(c) The power must be shut off; and

(d) The brakes must be set.

(e) If the truck is parked on an incline, the wheels must be blocked.

A powered industrial truck is "unattended" when the operator is 25 feet or more away from the vehicle, which remains in view, or whenever the operator leaves the vehicle and it is not in view.

(6) When a truck operator is dismounted, within 25 feet of the truck, and still in view, the load must be fully lowered, the controls must be neutralized, and the brakes must be set to prevent movement.

(7) The operator must maintain a safe distance from the edge of ramps or platforms while operating on any elevated dock, or platform or freight car.

(8) There must be enough headroom for trucks to operate under overhead installations, lights, pipes, sprinkler systems, or other overhead projections.

[Recodified as § 296-307-52031. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52031, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52033 When may trucks be used to open or close freight car doors? Trucks may only be used for opening or closing freight car doors with an approved device that meets the following requirements:

(1) The door opening or closing device requires that the force applied by the device to the door is parallel to the door travel.

(2) The truck operator is trained in the use of the door opening or closing device and keeps the operation in full view while opening and closing.

(3) The area is clear of people while the door is moved with a device.

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[Recodified as § 296-307-52033, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52033, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52035 What requirements apply to lifting employees on the forks of trucks? Employees may be lifted on the lifting carriage or forks of a powered industrial truck under the following conditions:

(1) The truck is equipped with vertical only, or vertical and horizontal controls elevatable with the lifting carriage or forks.

(2) A safety platform is firmly secured to the lifting carriage and/or forks.

(3) Employees on the platform have a mechanism to shut off power to the truck.

(4) Employees on the platform are protected from falling objects according to the operating conditions.

[Recodified as § 296-307-52035, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52035, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52037 What requirements apply to using platforms for hoisting employees? A platform built specifically for hoisting people may be used to lift employees when:

(1) The platform is securely attached to the forks and has standard guardrails and toeboards installed on all sides.

(2) The hydraulic system is designed so that the lift mechanism will not drop faster than 135 feet per minute in the event of a failure in any part of the system. Forklifts used for elevating work platforms are identified as meeting this requirement.

(3) A safety strap is installed or the control lever is locked to prevent the boom from tilting.

(4) An operator attends the lift equipment while employees are on the platform.

(5) The operator is in the normal operating position while raising or lowering the platform.

(6) The vehicle remains stationary while employees are on the platform.

Exception: Inching or maneuvering at very slow speed is permissible.

(7) The area between employees on the platform and the mast is adequately guarded to prevent contact with chains or other shear points.

[Recodified as § 296-307-52037, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52037, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52039 What requirements apply to traveling in a powered industrial truck? (1) The operator must maintain a safe distance of approximately three truck lengths from the truck ahead. The truck must be kept under control at all times.

(2) The operator must yield the right of way to ambulances, fire trucks, or other vehicles in emergency situations.

(3) Passing other trucks traveling in the same direction at intersections, blind spots, or other dangerous locations is prohibited.

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(4) Railroad tracks must be crossed diagonally wherever possible. The operator must not park closer than 8 feet from the center of railroad tracks.

(5) The operator must look in the direction of, and keep a clear view of, the path of travel.

(6) Stunt driving and horseplay are prohibited.

(7) The operator must approach elevators slowly, and then enter squarely after the elevator car is properly leveled. Once on the elevator, the operator must neutralize controls, shut off power, and set the brakes.

(8) Motorized hand trucks must enter elevator or other confined areas with load end forward.

(9) The operator must avoid running over loose objects on the roadway surface.

[Recodified as § 296-307-52039, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52039, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52041 What requirements apply to traveling speeds of powered industrial trucks? (1) The operator must observe all traffic regulations, including authorized plant speed limits.

(2) The operator must slow down and sound the horn at cross aisles and other locations where vision is obstructed. If the load obstructs a forward view, the driver must travel with the load trailing.

Exception: If traveling with the load trailing creates new hazards, it is not required.

(3) The operator must ascend and descend grades slowly.

(a) At grades over 10 percent, loaded trucks must be driven with the load upgrade.

(b) Unloaded trucks should be operated on all grades with the load carrier downgrade.

(c) On all grades the load and load carrier must be tilted back if applicable, and raised only as far as necessary to clear the road surface.

(4) Under all travel conditions, the truck must be operated at a speed that will permit it to be stopped safely.

(5) The driver must slow down for wet and slippery floors.

(6) While negotiating turns, the operator must slow to a safe speed and turn the wheel in a smooth, sweeping motion.

[Recodified as § 296-307-52041, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52041, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52043 What requirements apply to loading powered industrial trucks? (1) All loads must be stable or safely arranged. Exercise caution when handling off-center loads that cannot be centered.

(2) All loads must be within the rated capacity of the truck.

(3) Take care securing, manipulating, positioning, and transporting loads when attachments are used. Trucks with attachments must be operated as partially loaded trucks when not handling a load.

(4) Place the load carrier under the load as far as possible. Tilt the mast backward to stabilize the load.

(5) Use extreme care when tilting the load forward or backward, particularly when high tiering. Avoid tilting the

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load forward with the load carrier elevated except to pick up a load, or when the load is in a deposit position over a rack or stack. When stacking or tiering, use only enough backward tilt to stabilize the load.

[Recodified as § 296-307-52043, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52043, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52045 What requirements apply to servicing powered industrial trucks? (1) Powered industrial trucks that need repairs, are defective, or in any way unsafe must be taken out of service until restored to safe operating condition.

(2) Stop the engine before filling fuel tanks. Avoid spilling fuel.

(3) When oil or fuel spills, wash the spill away carefully or evaporate the spill completely and replace the fuel tank cap before restarting engine.

(4) No truck may be operated with a leak in the fuel system.

(5) Open flames are prohibited for checking electrolyte level in storage batteries or gasoline level in fuel tanks.

[Recodified as § 296-307-52045, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52045, filed 10/31/96, effective 12/1/96.]

WAC 296-307-52047 What requirements apply to maintaining powered industrial trucks? (1) Powered industrial trucks must be removed from service when not in safe operating condition. All repairs must be made by an authorized employee.

(2) No repairs may be made in Class I, II, and III locations.

(3) When repairs to fuel and ignition systems of industrial trucks involve fire hazards, the repairs must be conducted only in designated locations.

(4) Trucks in need of repairs to the electrical system must have the battery disconnected prior to repair.

(5) Industrial truck parts must be replaced only by parts of equivalent safety.

(6) Industrial trucks must not be altered so that the relative positions of parts are different from when they were manufactured. Industrial trucks must not have parts added or eliminated, except as provided in WAC 296-307-52005. Fork trucks must not have additional counterweighting added unless approved by the truck manufacturer.

(7) Industrial trucks must be examined at least daily before being placed in service. Industrial trucks must not be placed in service if the examination shows any unsafe condition.

Where industrial trucks are used on a round-the-clock basis, they shall be examined after each shift. Defects must be immediately reported and corrected.

(8) Water mufflers must be filled daily or as frequently as necessary to prevent the water supply from dropping below 75 percent. Vehicles must not be operated if muffler screens or other parts are clogged. Any vehicle that emits hazardous sparks or flames from the exhaust system must immediately be removed from service until the emission of such sparks and flames has been eliminated.

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(9) When the temperature of any part of any truck exceeds its normal operating temperature, the vehicle must be removed from service until the cause for overheating has been eliminated.

(10) Industrial trucks must be kept clean and free of excess accumulations of combustible materials, oil, and grease. Noncombustible agents should be used for cleaning trucks. Low flash point (below 100°F) solvents must not be used. High flash point (at or above 100°F) solvents may be used. Take precautions regarding toxicity, ventilation, and fire hazard according to the agent or solvent used.

(11) Glycol base antifreeze must be used in the engine cooling system.

(12) Industrial trucks originally approved to use gasoline fuel may be converted to use LP-gas fuel if the converted truck has the features specified for LP or LPS designated trucks. The converted equipment must be approved. You may find a description of the conversion system and the recommended method of installation in the "listed by report" of a nationally recognized testing laboratory.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-52047, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-52047, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-52047, filed 10/31/96, effective 12/1/96.]

Part X Rim Wheel Servicing

WAC 296-307-530 Rim wheel servicing.

[Recodified as § 296-307-530, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-530, filed 10/31/96, effective 12/1/96.]

WAC 296-307-53001 What does this section cover? WAC 296-307-530 applies to the servicing of multipiece and single-piece rim wheels used on large vehicles such as trucks, tractors, trailers, buses and off-road machines. It does not apply to servicing rim wheels used on automobiles, or on pickup trucks and vans with automobile tires or truck tires designated "LT."

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-53001, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-53001, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-53001, filed 10/31/96, effective 12/1/96.]

WAC 296-307-53003 What definitions apply to rim wheel servicing? "Barrier" means a fence, wall, or structure placed between a single-piece rim wheel and an employee during tire inflation, to contain the rim wheel components in the event of the sudden release of the contained air of the single-piece rim wheel.

"Charts" means the United States Department of Labor, Occupational Safety and Health Administration (OSHA) publications entitled "Demounting and Mounting Procedures for Truck/Bus Tires" and "Multi-Piece Rim Matching Chart," the National Highway Traffic Safety Administration (NHTSA) publications entitled "Demounting and Mounting Procedures for Truck/Bus Tires" and "Multi-Piece Rim Matching Chart," or any other poster that contains at least the same instructions, safety precautions and other information

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contained in the charts that is applicable to the types of wheels being serviced.

"Installing a rim wheel" means the transfer and attachment of an assembled rim wheel onto a vehicle axle hub. "Removing" means the opposite of installing.

"Mounting a tire" means the assembly or putting together of the wheel and tire components to form a rim wheel, including inflation. "Demounting" means the opposite of mounting.

"Multipiece rim wheel" means the assembly of a multipiece wheel with the tire tube and other components.

"Multipiece wheel" means a vehicle wheel consisting of two or more parts, one of which is a side or locking ring designed to hold the tire on the wheel by interlocking components, when the tire is inflated.

"Restraining device" means a cage, rack, assembly of bars, or other components that will constrain all rim wheel components during an explosive separation of a multipiece rim wheel, or during the sudden release of the contained air of a single-piece rim wheel.

"Rim manual" means a publication containing instructions from the manufacturer or other qualified organization for correct mounting, demounting, maintenance, and safety precautions peculiar to the type of wheel being serviced.

"Rim wheel" means an assembly of tire, tube and liner (where appropriate), and wheel components.

"Service" or "servicing" means the mounting and demounting of rim wheels, and related activities such as inflating, deflating, installing, removing, and handling.

"Service area" means that part of an employer's premises used for the servicing of rim wheels, or any other place where an employee services rim wheels.

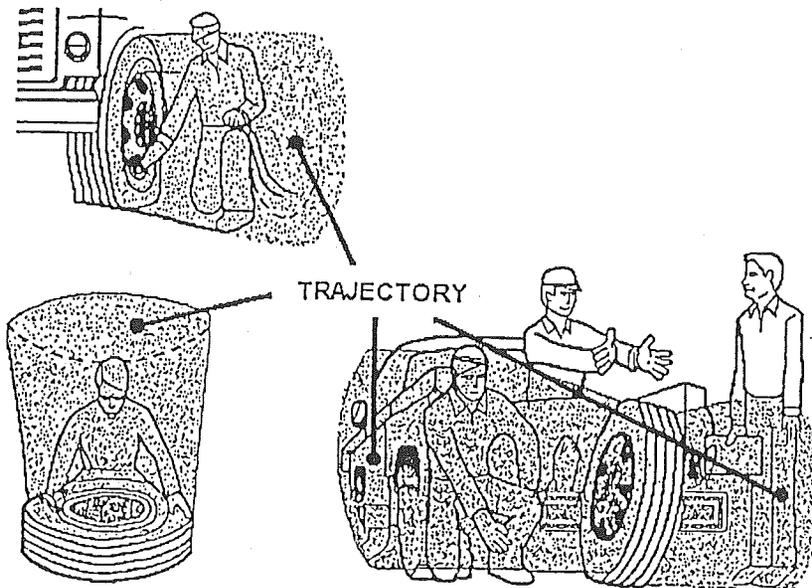
"Single-piece rim wheel" means the assembly of single-piece rim wheel with the tire and other components.

"Single-piece wheel" means a vehicle wheel consisting of one part, designed to hold the tire on the wheel when the tire is inflated.

"Trajectory" means:

- Any potential path that a rim wheel component may travel during an explosive separation, or the sudden release of the pressurized air; or
- An area at which an air blast from a single-piece rim wheel may be released.

The trajectory may deviate from paths that are perpendicular to the assembled position of the rim wheel. (See Figure for examples of trajectories.)



"Wheel" means the part of a rim wheel that provides the method of attachment of the assembly to the axle of a vehicle and also provides the means to contain the inflated portion of the assembly (i.e., the tire and/or tube).

[Recodified as § 296-307-53003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-53003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-53005 What training must an employer provide for employees who service rim wheels?

(1) You must implement a training program that covers at least the following:

- (a) The hazards involved in servicing rim wheels;
- (b) The safe operating procedures for the types of wheel serviced, described in WAC 296-307-53013 and 296-307-53015; and

(c) The applicable data contained in the charts (rim manuals) and the contents of this standard.

(2) You must ensure that each employee demonstrates and maintains the ability to service rim wheels safely, including the following:

- (a) Demounting tires (including deflation);
- (b) Inspecting and identifying the rim wheel components;
- (c) Mounting tires (including inflation with a restraining device or other safeguard required by this section);
- (d) Using the restraining device and other equipment required by this section;
- (e) Handling rim wheels;
- (f) Inflating the tire when a single-piece rim wheel is mounted on a vehicle;

(g) Understanding the necessity of standing outside the trajectory both during inflation of the tire and during inspection of the rim wheel following inflation; and

(h) Installing and removing rim wheels.

(3) If you believe that any employee is unable to read and understand the charts or rim manual, you must instruct the employee in the contents of the charts and rim manual in a manner that the employee can understand.

(4) You must evaluate each employee's ability to perform these tasks safely, and provide additional training as necessary to ensure that each employee maintains proficiency.

[Statutory Authority: RCW 49.17.040, 98-24-096, § 296-307-53005, filed 12/1/98, effective 3/1/99; Recodified as § 296-307-53005, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-53005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-53007 What requirements apply to restraining devices? (1) You must furnish a restraining device for inflating tires on multipiece wheels.

(2) You must provide a restraining device for inflating tires on single-piece wheels unless the rim wheel will be bolted onto a vehicle during inflation.

(3) Restraining devices must:

(a) Withstand the force of a rim wheel separation occurring at 150% of the maximum tire pressure for the rim wheel being serviced.

(b) Prevent the rim wheel components from being thrown out of the device.

(c) The restraining device is visually inspected before each day's use and after any rim wheel separation or sudden release of contained air. Any damaged restraining device is immediately removed from service.

(d) If the restraining device is removed from service, it is not returned to service until repaired and reinspected. If the restraining device requires structural repair, it is not returned to service until certified by either the manufacturer or a registered professional engineer to meet the strength requirements of (a) of this subsection.

[Recodified as § 296-307-53007, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-53007, filed 10/31/96, effective 12/1/96.]

WAC 296-307-53009 What other equipment must an employer provide for rim wheel servicing? (1) You must furnish an air line assembly and ensure that employees use it for inflating tire.

(2) The air line assembly must contain the following components:

(a) A clip-on chuck;

(b) An in-line valve with a pressure gauge or a presettable regulator; and

(c) Enough hose between the clip-on chuck and the in-line valve (if one is used) to allow the employee to stand outside the trajectory.

(3) Current charts or rim manuals for the types of wheels being serviced shall be available in the service area.

(4) You must furnish the tools recommended in the rim manual for the type of wheel being serviced and ensure that they are the only tools used to service rim wheels.

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[Recodified as § 296-307-53009, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-53009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-53011 What requirements apply to wheel component assembly? (1) You must ensure that multipiece wheel components are not interchanged except as provided in the charts or rim manual.

(2) Multipiece wheel components and single-piece wheels must be inspected prior to assembly. Any wheel or wheel component that is bent out of shape, pitted from corrosion, broken, or cracked shall not be used. Mark damaged wheels or components "unserviceable" and remove from the service area. Replace damaged or leaky valves.

(3) Rim flanges, rim gutters, rings, bead seating surfaces and the bead areas of tires must be free of any dirt, surface rust, scale or loose or flaked rubber build-up prior to mounting and inflation.

(4) The size (bead diameter and tire/wheel widths) and type of both the tire and the wheel must be checked for compatibility before assembly.

[Recodified as § 296-307-53011, 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060, 96-22-048, § 296-306A-53011, filed 10/31/96, effective 12/1/96.]

WAC 296-307-53013 What are the safe operating procedures for servicing multipiece rim wheels? You must establish safe operating procedures for servicing multipiece rim wheels, and ensure that employees are instructed in and follow the procedures. Your procedures must include at least the following:

(1) Before demounting, remove the valve core to completely deflate the tire.

(2) Remove the valve core to completely deflate the tire before removing a rim wheel from the axle whenever:

(a) The tire has been driven on underinflated at eighty percent or less of its recommended pressure; or

(b) There is obvious or suspected damage to the tire or wheel components.

(3) Apply rubber lubricant to bead and rim mating surfaces during wheel assembly and tire inflation, unless the tire or wheel manufacturer recommends against it.

(4) A tire on a vehicle underinflated at more than eighty percent of the recommended pressure may be inflated while the rim wheel is on the vehicle, only if remote control inflation equipment is used and no employees remain in the trajectory during inflation.

(5) Tires may be inflated outside a restraining device only to pressure sufficient to force the tire bead onto the rim ledge and to create an airtight seal with the tire and bead.

(6) Whenever a rim wheel is in a restraining device, the employee must not rest any part of the body or equipment on the restraining device.

(7) After tire inflation, inspect the tire and wheel components while still within the restraining device. Ensure that they are properly seated and locked. If further adjustment to the tire or wheel components is necessary, deflate the tire by removing the valve core before making adjustments.

(8) Never correct the seating of side and lock rings by hammering, striking, or forcing the components while the tire is pressurized.

(9) Cracked, broken, bent, or otherwise damaged rim components shall not be reworked, welded, brazed, or otherwise heated.

(10) When handling multipiece rim wheels, employees must stay out of the trajectory unless the performance of the servicing makes the employee's presence in the trajectory necessary.

(11) Do not apply heat to a multipiece wheel or wheel component.

[Recodified as § 296-307-53013. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-53013, filed 10/31/96, effective 12/1/96.]

WAC 296-307-53015 What are the safe operating procedures for servicing single-piece rim wheels? You must establish safe operating procedures for servicing single-piece rim wheels, and ensure that employees are instructed in and follow the procedures. Your procedures must include at least the following:

(1) Before demounting, remove the valve core to completely deflate the tire.

(2) Mount and demount tires only from the narrow ledge side of the wheel. Take care to avoid damaging the tire beads while mounting. Only mount tires on compatible wheels of matching bead diameter and width.

(3) Apply nonflammable rubber lubricant to bead and wheel mating surfaces before rim wheel assembly, unless the tire or wheel manufacturer recommends against it.

(4) When using a tire changing machine, inflate tires only to the minimum pressure necessary to force the tire bead onto the rim ledge while on the tire changing machine.

(5) When using a bead expander, remove the bead expander before the valve core is installed and as soon as the rim wheel becomes airtight (the tire bead slips onto the bead seat).

(6) Always inflate tires within a restraining device, positioned behind a barrier, or bolted on the vehicle with the lug nuts fully tightened.

(7) Inflate tires only when the trajectory area is clear of flat, solid objects.

(8) Employees stay out of the trajectory when inflating a tire.

(9) Tires must not be inflated to more than the inflation pressure stamped in the sidewall unless a higher pressure is recommended by the manufacturer.

(10) Tires must not be inflated above the maximum pressure recommended by the manufacturer to seat the tire bead firmly against the rim flange.

(11) Heat must not be applied to a single-piece wheel.

(12) Cracked, broken, bent, or otherwise damaged wheels must not be reworked, welded, brazed, or otherwise heated.

[Recodified as § 296-307-53015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-53015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-53017 How can an employer order the OSHA charts? OSHA charts are available through OSHA area offices. You may find the address and telephone number of the nearest OSHA office in the local telephone directory under U.S. Government, U.S. Department of Labor, Occupa-

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tional Safety and Health Administration. Single copies are available without charge.

If you want multiple copies of these charts, you may order them from the Publications Office, U.S. Department of Labor, Room N3101, Washington, D.C. 20210. Telephone: (202) 523-9667.

[Recodified as § 296-307-53017. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-53017, filed 10/31/96, effective 12/1/96.]

Chapter 296-310 WAC

FARM LABOR CONTRACTING RULES

WAC

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WAC 296-310-010 Definitions. For the purposes of this chapter:

(1) "Agricultural employee" means any person who renders personal services to, or under the direction of, an agricultural employer in connection with the employer's agricultural activity.

(2) "Agricultural employer" means any person engaged in agricultural activity, including the growing, producing, or harvesting of farm or nursery products, or engaged in the forestation or reforestation of lands, which includes but is not limited to the planting, transplanting, tubing, precommercial thinning, and thinning of trees and seedlings, the clearing, piling, and disposal of brush and slash, the harvest of Christmas trees, and other related activities.

(3) "Bonded contractor" means a contractor who obtained a surety bond in order to comply with RCW 19.30.030(5).

(4) "Contractor" means a farm labor contractor.

(5) "Department" means the department of labor and industries.

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

(7) "Employee" means an agricultural employee.

(8) "Farm labor contractor" means any person, or his or her agent or subcontractor, who, for a fee, performs any farm labor contracting activity.

(9) "License" means a farm labor contractor license.

(10) "Secured contractor" means a contractor who assigned a savings account to, or deposited cash or other security with, the department in order to comply with RCW 19.30.030(5).

(11) "Security" means a savings account assigned to, or cash or other security deposited with, the department.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-010, filed 12/11/85.]

WAC 296-310-020 Application for initial and renewed licenses. (1) To obtain a license, a contractor must:

(a) Complete an application for a license;

(b) Provide the information required by RCW 19.30.030 (1), (6), and (7);

(c) Obtain a surety bond or provide other acceptable security to the department. If the contractor obtains a bond, it must submit the original bond to the department;

(d) Obtain insurance and supply the information required by WAC 296-310-040(2) if the contractor seeks a license to transport workers; and

(e) Pay the fee set by WAC 296-310-060.

(2) The department shall send a renewal notice to the contractor's last recorded address at least forty-five days before the contractor's license expires. The contractor may renew its license if it submits the renewal notice and provides the materials required in subsection (1)(b), (c), (d) if appropriate, and (e) of this section.

(3) The contractor must submit all materials to the department in one package. Each of the materials must name the contractor exactly as it is named on the application for license or the renewal notice. If the contractor is renewing its license, each of the materials must include the contractor's license number. If any of the materials are missing, do not properly name the contractor, or do not include the license number, the department shall refuse to license or renew the license of the contractor.

(4) The bond and the insurance policy must expire no sooner than the expiration date of the license for which the contractor has applied.

(5) Applications for issuance or renewal of a license must be sent to:

Department of Labor and Industries
ESAC Division
General Administration Building
Olympia WA 98504

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-020, filed 12/11/85.]

WAC 296-310-030 Denial of license. (1) The department may refuse to issue or renew a license for the reasons listed in RCW 19.30.050 and 19.30.060. If the department refuses a license for any of these reasons, it shall serve on the contractor a notice of denial of license. The notice of denial of license shall:

(a) Describe concisely the ground for denial of the license; and

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(b) Specify the statutory authority for the denial.

The notice of denial shall inform the contractor that it may request a hearing pursuant to WAC 296-310-160 on the denial. The notice shall specify that if no hearing is requested within thirty days of the date of issuance of the notice the director shall issue a final, unappealable order denying the license.

(2) The department also shall refuse to issue a license to or renew the license of a contractor who fails to comply with WAC 296-310-020. The department shall inform the contractor of the problem either in writing or, if appropriate, orally. Because compliance with WAC 296-310-020 involves technical requirements that are entirely within the control of the contractor, no hearing shall be granted on a failure to comply.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-030, filed 12/11/85.]

WAC 296-310-040 Requirements for a license to transport employees. (1) A contractor who intends to transport employees must obtain liability insurance. The department shall require public liability and property damage insurance that provides coverage, for each single occurrence and for each vehicle used to transport employees, in the following minimum amounts:

(a) \$50,000 for injury or damage to property;

(b) \$100,000 for injury or damage, including death, to any one person; and

(c) \$500,000 for injury or damage, including death, to more than one person.

(2) The contractor must also provide to the department evidence of the insurance policy or policies.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-040, filed 12/11/85.]

WAC 296-310-050 Amount of bond or security. (1) A contractor must provide a bond or security in the following minimum amount:

(a) If the contractor employs or intends to employ:

(i) From one to ten employees: \$ 5,000

(ii) From eleven to fifty employees: \$10,000

(iii) From fifty-one to one hundred employees: \$15,000

(iv) Over one hundred employees: \$20,000

(b) If the contractor does not employ agricultural employees, but only recruits, solicits, supplies, transports, or hires employees for another person, and that person takes complete responsibility for payment of wages to the employees, the contractor shall obtain a \$5,000 bond or other security.

(2) If the contractor obtains a two-year license, the bond or security shall be twice the minimum amounts stated in subsection (1) of this section.

(3) The department may order the contractor to obtain a bond or security for an amount greater than the minimums set by subsections (1) and (2) of this section if the security or bond is insufficient to satisfy the contractor's potential liability for the license period. If the department determines that an increased bond is necessary, it shall serve on the contractor a notice to increase bond or security. The notice shall:

(a) Describe concisely the reasons an increase in the bond or security is necessary;

(b) Specify the statutory authority for the required increase; and

(c) Grant the contractor thirty days from the date of issuance of the notice to obtain and provide to the department the increased bond or security.

The notice shall inform the contractor that it may request a hearing pursuant to WAC 296-310-160 on the order to increase the bond or security. The notice shall specify that if no hearing is requested within thirty days of the date of issuance of the notice the director shall issue a final, unappealable order requiring the contractor to submit the increased bond or security. The notice shall also specify that, if the contractor neither appeals nor obtains the increased bond or security within the thirty days, the department shall suspend the contractor's license.

(4) If the director issues a final, unappealed decision raising the amount of the bond or security, the raised amount shall be required for all license periods after the date of issuance of the final decision unless the decision specifically states otherwise. A contractor may, if the circumstances that led to the increased amount change, file with the department a written petition to lower the amount. The petition shall specify the grounds that justify a lowering of the bond or security. The department shall investigate the petition and shall issue a new notice stating its decision on the bond amount. The contractor, if aggrieved, may appeal this new notice as provided in subsection (3) of this section.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-050, filed 12/11/85.]

WAC 296-310-060 Fees. (1) The fee for a one-year license is:

- (a) For a contractor engaged in forestation or reforestation: \$100.00
- (b) For all other contractors: \$ 35.00
- (2) The fee for a two year license is:
- (a) For a contractor engaged in forestation or reforestation: \$200.00
- (b) For all other contractors: \$ 70.00

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-060, filed 12/11/85.]

WAC 296-310-070 Duplicate licenses. If a contractor loses its license, or if the license is stolen or destroyed, the contractor may obtain a duplicate license upon application to the department. The application must specify the reason a duplicate is necessary.

The duplicate license shall be stamped prominently with the word "duplicate." A new contractor license number shall be supplied to the contractor.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-070, filed 12/11/85.]

WAC 296-310-080 Length of license period. A contractor who is obtaining its initial license shall be licensed for one year only. A contractor who is renewing its license may choose to obtain either a one-year or two-year license, unless the department informs the contractor that it may obtain only a one-year license.

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All one-year licenses shall expire on December 31 of the year of issuance. All two-year licenses shall expire on December 31 of the year following the year of issuance.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-080, filed 12/11/85.]

WAC 296-310-090 Change in business structure, name, address, or number of employees. (1) If a contractor changes its business structure (for example, if it changes from a partnership to a corporation, or if the partners in a partnership change), the contractor must apply for a new license in the manner required by WAC 296-310-020. If a contractor does not obtain a new license after a change in its business structure, its previous license may be invalid.

(2) If a contractor changes its name or address, it must notify the department within ten days.

(3) If a contractor begins employing agricultural employees, or increases the number of its employees, so that the bond or security is insufficient for that number of employees, the contractor must obtain a new bond or security in the amount required by WAC 296-310-050 and submit it to the department. The department need not issue a notice to increase the amount of bond or security in this situation.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-090, filed 12/11/85.]

WAC 296-310-100 Cancellation of insurance or bond. (1) No surety company may cancel any bond issued to a contractor pursuant to RCW 19.30.040, unless the contractor previously submits another bond or other security, for the same amount, that covers the contractor's liability for the same period as that for the bond that is to be cancelled.

(2) A cancellation of a surety bond or insurance policy is effective thirty days after the department receives the cancellation notice, if the cancellation notice contains the following information:

- (a) The name of the contractor, exactly as it appears on the contractor's license;
- (b) The contractor's license number;
- (c) The contractor's business address;
- (d) The number of the bond or insurance policy that is to be cancelled;
- (e) The effective date of the bond or insurance policy that is to be cancelled; and

(f) If the cancellation is of a surety bond, a certification that the contractor has previously obtained and submitted to the department a new bond or other security as required by subsection (1) of this section.

(3) To help the department process cancellations, the information in subsection (2) of this section should be provided in the order shown.

(4) The insurance and bonding companies should send cancellation notices to the department by certified or registered mail.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-100, filed 12/11/85.]

WAC 296-310-110 Refund of security deposited with the department. (1) If a contractor is secured, the department shall release its interest in the security three years after the contractor's last license expired. The department shall not

release its interest, however, if an unsatisfied judgment or claim is outstanding against the contractor.

(2) The department shall in any case release its interest in the security if the contractor provides a surety bond in the same amount that covers all of the periods in which the contractor was licensed for the previous three years, plus for the contractor's current license period if applicable.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-110, filed 12/11/85.]

WAC 296-310-120 Revocation or suspension of license. (1) The department may revoke a contractor's license for the reasons listed in RCW 19.30.050(1) and 19.30.060. If the department revokes a license, it shall serve on the contractor a notice of revocation. The notice of revocation shall:

- (a) Describe concisely the ground for the revocation; and
- (b) Specify the statutory authority for the revocation.

The notice of revocation shall inform the contractor that it may request a hearing on the revocation. The notice shall specify that if no hearing is requested within thirty days after the date of issuance of the notice, the director shall issue a final, unappealable order revoking the contractor's license. The hearing may be requested pursuant to WAC 296-310-160.

(2) A contractor is entitled to retain its license only if it remains in compliance with the bonding and insurance requirements of RCW 19.30.030 and 19.30.040. If a contractor's surety bond or other security is impaired or becomes insufficient, the contractor's insurance policy is cancelled, or the contractor transports employees without insurance, the department shall suspend the contractor's license until the contractor obtains a new bond, other security, or insurance policy, eliminates the impairment to the bond or security, or ceases to transport workers. The contractor may not do business while its license is suspended.

The department shall inform the contractor in writing of the suspension and of the steps the contractor must take to remove the suspension. The contractor may not appeal a suspension of licensing.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-120, filed 12/11/85.]

WAC 296-310-130 Submission of complaint. Any person may submit to the department a complaint alleging a violation of chapter 19.30 RCW or challenging an application for a license. The complaint must describe the alleged violation or ground for denying a license, and must identify the alleged violator or applicant. It would aid the department's investigation if the complaint also specifies:

- (1) The name and address of the complainant; and
- (2) The address of the alleged violator or applicant.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-130, filed 12/11/85.]

WAC 296-310-140 Investigation of complaint. The department shall investigate a complaint unless the complaint was submitted more than three years after the date of the alleged violation. The department shall not investigate any complaint filed more than three years after the date of the violation.

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[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-140, filed 12/11/85.]

WAC 296-310-150 Notice of violation. (1) If the department determines that there is reasonable cause to believe that chapter 19.30 RCW has been violated, the department shall serve on the violator a notice of violation. The notice of violation shall:

- (a) Describe concisely the violation;
- (b) Specify which statute was violated;
- (c) If known, identify the employees who were affected by the violation;
- (d) If known and applicable, state the amount of unpaid wages or damages the violator owes;
- (e) State the penalty, if any, the department will assess for the violation; and
- (f) State whether the contractor's license is being revoked as a result of the violation.

(2) If the notice alleges that the contractor owes unpaid wages or damages, the department shall serve a copy of the notice of violation on the violator's surety bond company.

(3) The notice of violation shall inform the violator and, if applicable, its surety that they may request a hearing on the violation, the amount of unpaid wages or damages owed, or the penalty assessed. The notice shall specify that if no hearing is requested within thirty days after the date the notice was issued the director shall issue a final, unappealable order finding that the violation did occur, ordering the violator to pay any unpaid wages or damages, and assessing penalties.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-150, filed 12/11/85.]

WAC 296-310-160 Appeal of notices. (1) The contractor or violator, or the violator's surety if the surety has an interest in the matter, may request a hearing on the matter asserted in a notice of denial of license, a notice of revocation, a notice of increased bond amount, or a notice of violation. One original and four copies of the request must be filed with the director within thirty days after the date the department issued the notice. A party requesting a hearing on a notice of violation must also serve a copy of the request on the surety or the violator as appropriate.

(2) The request for hearing must be in writing and must specify:

- (a) The name and address of the party requesting the hearing;
- (b) The name and date of issuance of the notice that is being appealed;
- (c) The matters contained in the notice that the requestor believes are erroneous;
- (d) The reasons the notice is erroneous; and
- (e) If a surety is appealing a notice of violation, the name and address of the violating contractor.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-160, filed 12/11/85.]

WAC 296-310-170 Hearing on appeal of notice. (1) The director may hear an appeal personally or may delegate the authority to hold the hearing and draft a proposed decision to an administrative law judge pursuant to chapter 34.12 RCW. The plaintiff at the hearing shall be the department and

the defendants shall be the contractor or the violator and its surety. The department shall have the burden of proving, by a preponderance of the evidence, that the matters stated in the notice occurred.

(2) Any person who has standing may, upon motion, be allowed to intervene as a plaintiff in a hearing on a notice of violation. Any interested person, whether or not admitted as a plaintiff, may submit written arguments and affidavits in any hearing.

(3) The hearing shall be conducted in accordance with the uniform procedure rules, chapter 1-08 WAC.

(4) If the director presides over the hearing, the director shall issue a final decision that includes findings of fact and conclusions of law and, if appropriate for a violation, an order to pay unpaid wages, damages, or a penalty.

(5) If an administrative law judge presides over the hearing, she or he shall issue a proposed decision that includes findings of fact and conclusions of law and, if appropriate for a violation, an order to pay unpaid wages, damages, or a penalty. The proposed decision shall be served on the contractor or the violator and its surety, the department, and any persons who have intervened as plaintiffs. Any of these parties, if aggrieved by the proposed decision, may appeal to the director within thirty days after the date of issuance of the proposed decision. If none of the parties appeals within thirty days, the proposed decision may not be appealed either to the director or the courts. A copy of the proposed decision shall also be mailed to all persons who submitted written arguments or affidavits at the hearing.

(6) An appellant must file with the director an original and four copies of its notice of appeal. The notice of appeal must specify which findings and conclusions are erroneous. The appellant must attach to the notice the written arguments supporting its appeal.

The appellant must serve a copy of the notice of appeal and the arguments on the other parties. The respondent parties must file with the director their written arguments within thirty days after the date the notice of appeal and the arguments were served upon them.

(7) The director shall review the proposed decision in accordance with the Administrative Procedure Act, chapter 34.04 RCW. The director may: Require the parties to specify the portions of the record on which the parties rely; require the parties to submit additional information by affidavit or certificate; remand the matter to the administrative law judge for further proceedings; and require a department employee to prepare a summary of the record for the department to review. The director may allow the parties to present oral arguments as well as the written arguments. The director shall issue a final decision that can affirm, modify, or reverse the proposed decision.

(8) The director shall serve the final decision on all parties. Any aggrieved party may appeal the final decision to superior court pursuant to RCW 34.04.130 unless the final decision affirms an unappealed proposed decision. If no party appeals within the period set by RCW 34.04.130, the director's decision is conclusive and binding on all parties. The director shall also mail a copy of the final decision to all persons who submitted written arguments or affidavits at the hearing.

(1999 Ed.)

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-170, filed 12/11/85.]

WAC 296-310-180 Effect of final decision. If the director issues a final decision that includes a finding that a violator owes unpaid wages or damages, and the finding is not appealed or is affirmed by the courts, the finding and the decision are res judicata in any action by the department, or by any other person who was a plaintiff at the hearing, against the violator and its surety to recover the unpaid wages or damages. The finding and decision are not res judicata in any action by a person who was not a party at the hearing.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-180, filed 12/11/85.]

WAC 296-310-190 Suit by department for unpaid wages or damages. (1) RCW 19.30.160(4) authorizes the department to sue a violator and its surety on behalf of an employee to recover unpaid wages and other damages. The department is not required to bring suit and, in its sole discretion, may decide not to do so in any case. The department also shall not sue on behalf of any employee who has already brought a suit against the violator and its surety in the matter.

(2) The department may file a suit against the violator and its surety at any time and without regard to whether administrative proceedings have been exhausted.

(3) The department may include in any suit a request for an injunction against the violator.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-190, filed 12/11/85.]

WAC 296-310-200 Procedures for filing suit against a contractor. (1) A suit against a contractor and its bond or security for unpaid wages or damages may be brought in any court with jurisdiction. The venue may be in the county in which the claim arose, or in which either the damaged person or the defendant resides.

(2) When a contractor is sued, the plaintiff must serve the summons and complaint on the contractor and its surety by serving three copies of the summons and complaint by certified or registered mail on the department. The department shall not accept personal service of the summons and complaint.

(3) The department may be unable to process a summons and complaint if the summons and complaint do not contain the following information:

(a) The contractor's name exactly as it appears on the contractor's license;

(b) The contractor's business address;

(c) The names of the owners, partners, or officers of the contractor; and

(d) The contractor's license number.

If the suit names a surety as a defendant, the summons and complaint should also include:

(e) The name and address of the surety that issued the contractor's bond;

(f) The bond number; and

(g) The effective date of the bond.

If the information is insufficient for the department to identify the contractor or surety that is being sued, the depart-

ment shall not attempt to serve the summons and complaint and shall return them to the plaintiff.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-200, filed 12/11/85.]

WAC 296-310-210 Collection of judgments. (1) If a contractor is secured, a plaintiff who has received a final judgment against a contractor may satisfy the judgment out of the security held by the department.

(2) The department shall satisfy a final judgment if the plaintiff serves on the department three certified copies of the unsatisfied judgment. The plaintiff must include the following information with the copies of the judgment:

- (a) The name of the contractor, exactly as it appears on the contractor's license;
- (b) The contractor's business address;
- (c) The names of the owners, partners, or officers of the contractor;
- (d) The contractor's license number; and
- (e) The exact amount of the judgment awarded by the court, including attorney's fees and interest.

If the department does not receive sufficient information to enable it to pay the judgment, it shall inform the plaintiff that more information is needed.

(3) If a contractor is bonded, a plaintiff can satisfy a final judgment only against the contractor or the bonding company. The department can neither satisfy the judgment nor, unless the department itself is the plaintiff, force the contractor or the bonding company to pay the judgment. The plaintiff must join the bonding company in the suit if it wants the bonding company to pay the judgment.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-210, filed 12/11/85.]

WAC 296-310-220 Priority for payment of judgments. RCW 19.30.170 contains two different provisions for priority in paying judgments from the contractor's bond or security.

(1) If a contractor is secured, the department shall satisfy final judgments against the contractor in the order the department receives the judgments.

(2) If a contractor is bonded, claims for unpaid wages and benefits are satisfied first, claims for damages are satisfied second, and claims for costs and attorney's fees are satisfied last. No claim in a lesser category may be satisfied until all pending claims in the preceding categories are satisfied, unless the total amount of all pending claims in the preceding categories is less than the amount of the bond that remains unimpaired.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-220, filed 12/11/85.]

WAC 296-310-230 Civil penalties. (1) In determining the amount of any civil penalty to be imposed under RCW 19.30.160 the department shall consider the following factors:

- (a) Previous violations by the violator;
- (b) The history of the violator in taking all necessary measures to prevent or correct violations;
- (c) The magnitude and seriousness of the violation;
- (d) The remedial purpose of chapter 19.30 RCW;

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- (e) Any mitigating circumstances; and
 - (f) Any other factors the department considers relevant.
- (2) It is the violator's responsibility to inform the department of mitigating evidence.

(3) The penalties for acting as a contractor without a license, or for transporting employees without an endorsement to do so, are:

- (a) Up to \$500 for the first violation;
- (b) Up to \$750 for the second violation; and
- (c) Up to \$1000 for the third and any further violations.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-230, filed 12/11/85.]

WAC 296-310-240 Adjustment of controversies. (1) Upon receipt of a complaint or on its own motion, the department shall attempt to adjust equitably a controversy between a contractor and its employees.

(2) No particular form of proceeding is necessary for resolving disputes. The supervisor of employment standards shall, in each case, use his or her best judgment in designing a procedure. However, in every case in which the supervisor determines that a hearing should be held, the supervisor shall notify the affected persons, or their representatives, of the time, date, place, and purpose of the hearing.

(3) A hearing shall be informal and shall not be subject to chapter 34.04 RCW. The supervisor's suggestions for resolution are advisory and not binding, and may not be appealed to any person or court.

(4) The director may delegate the resolution of any particular case to a person other than the supervisor of employment standards. That person shall have the same authority as the supervisor to determine the form of the proceeding.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-240, filed 12/11/85.]

WAC 296-310-250 Filing and service. All papers required to be filed with the director under this chapter or chapter 19.30 RCW shall be addressed to Director, Department of Labor and Industries, General Administration Building, Olympia, WA 98504.

Filing and service may be made as provided in WAC 1-08-090 through 1-08-140.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-250, filed 12/11/85.]

WAC 296-310-260 Liability of person who uses services of unlicensed contractor. (1) A person who knowingly uses the services of an unlicensed contractor is liable for unpaid wages, damages, and civil and criminal penalties to the same extent as the unlicensed contractor.

(2) Pursuant to RCW 19.30.200, a person may prove lack of knowledge by proving that she or he relied on a license issued by the department under chapter 19.30 RCW, or upon the department's representation that the contractor was licensed. The department shall not make oral representations that a contractor is or is not licensed. All representations by the department that a contractor is licensed shall be made in writing and shall be signed by the director or the employment standards supervisor or the assistant director. The department shall not accept reliance on a supposed oral representation as proof in any administrative enforcement proceeding.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-260, filed 12/11/85.]

WAC 296-310-270 Inspection of records. A contractor or any person using a contractor's services shall allow a representative of the department to inspect at any reasonable time the records it is required to keep by chapter 19.30 RCW.

[Statutory Authority: RCW 19.30.130. 86-01-027 (Order 85-34), § 296-310-270, filed 12/11/85.]

Chapter 296-350 WAC REASSUMPTION OF JURISDICTION PURSUANT TO RCW 49.17.140

WAC

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DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-350-300	Repeat violations. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-06-002 (Order 86-17), § 296-350-300, filed 2/20/86.] Repealed by 91-24-017 (Order 91-07), filed 11/22/91, effective 12/24/91. Statutory Authority: Chapter 49.17 RCW.
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WAC 296-350-010 Definitions. (1) The definitions and interpretations of RCW 49.17.020 shall apply to the provisions of this chapter unless the context of the provision clearly requires otherwise.

(2) "Presiding officer" means that person designated by the director as being responsible for the conducting of the informal conference provided for in RCW 49.17.140(3) and WAC 296-350-070.

(3) "Act" means the Washington Industrial Safety and Health Act (chapter 80, Laws of 1973; chapter 49.17 RCW) as now or hereafter amended.

(4) "Assistant director" shall mean the assistant director of consultation and compliance of the department, or his/her designated representative.

(5) "Citation" shall mean that CITATION issued to an employer in accordance with the provisions of RCW 49.17.120, otherwise known as a CITATION AND NOTICE. (Form No. WISHERS-110.)

(6) "Abatement date" shall mean the date identified as such on the CITATION. The "abatement date" is the date by which the condition identified in the CITATION must be brought into compliance with the cited safety and health standard.

(7) "Division" shall mean the division of consultation and compliance of the department.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-010, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-010, filed 11/13/80; Order 75-14, § 296-350-010, filed 4/14/75; Order 74-21, § 296-350-010, filed 5/6/74.]

WAC 296-350-020 Reassumption of jurisdiction—Purpose. The purpose of the department's reassuming jurisdiction over all or any part of the subject matter of a notice of appeal, as authorized by RCW 49.17.140(3), is to afford an opportunity for those parties authorized to file such a notice of appeal to present relevant and material facts, opinions and other relevant and material information, material or data to the department in support of or in opposition to the subject matter of the appeal.

[Order 75-14, § 296-350-020, filed 4/14/75; Order 74-21, § 296-350-020, filed 5/6/74.]

WAC 296-350-030 Notice of appeal—Filing and service. Any party authorized to appeal from an action of the department as set forth in RCW 49.17.140(3), may do so by filing a notice of appeal in writing in the recommended manner and containing the recommended subject matter as hereinafter set forth with fifteen working days of the communication of the notice, by serving a copy of such notice of appeal either in person or by mail upon the assistant director of the Division of Consultation and Compliance, P.O. Box 44600, Olympia, Washington 98504-4600.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-030, filed 7/20/94, effective 9/20/94; 90-09-026 (Order 90-01), § 296-350-030, filed 4/10/90, effective 5/25/90. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-030, filed 11/13/80; Order 75-14, § 296-350-030, filed 4/14/75; Order 74-21, § 296-350-030, filed 5/6/74.]

WAC 296-350-040 Notice of appeal—Contents. In order to expedite the decision of the department as to whether

to reassume jurisdiction over the subject matter of the appeal and in order to facilitate the certification of the notice of appeal and department file to the board of industrial insurance appeals, if appropriate, the notice of appeal should contain:

- (1) The name and address of the appealing party and his/her representative, if any;
- (2) The place where the alleged safety violation occurred;
- (3) A statement identifying the order, decision or citation appealed from by report number and date of issuance.
- (4) The grounds upon which the appealing party considers such order, decision or citation to be unjust or unlawful;
- (5) A statement of facts in support of each ground stated;
- (6) The relief sought, including the specific nature and extent;
- (7) A statement that the person signing the notice of appeal has read it and to the best of his/her knowledge, information and belief there is good ground to support it. A notice of appeal may be signed by the party or by his/her authorized representative.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-040, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-040, filed 4/14/75; Order 74-21, § 296-350-040, filed 5/6/74.]

WAC 296-350-050 Reassumption of jurisdiction—Time—Notice of reassumption of jurisdiction and informal conference. After receipt of a notice of appeal filed pursuant to RCW 49.17.140(3), and these rules, the department after investigation of the allegations contained in the notice of appeal, and not later than five working days from the date of receipt of such notice of appeal, shall make a determination to reassume jurisdiction over the subject matter of the appeal or, in the alternative, certify the record of the department which is the subject of appeal to the board of industrial insurance appeals along with such notice of appeal. If the department determines to reassume jurisdiction over the subject matter of the appeal, a **notice of reassumption of jurisdiction** and a **notice of informal conference** shall be issued giving notice that jurisdiction has been reassumed and that an opportunity will be afforded to all appealing parties as well as other interested parties as prescribed in RCW 49.17.140(3), to participate in an informal conference and that any redetermination and corrective notices will be completed not later than thirty working days (that may be extended an additional fifteen working days upon agreement of all parties to the appeal) following the date that the determination to reassume jurisdiction was made. The notice of informal conference shall give notice of the time, date and place at which such informal conference is to be conducted. The **notice of reassumption of jurisdiction and informal conference** may be combined on one document and issued as a single notice.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-050, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-16-008 (Order 86-27), § 296-350-050, filed 7/25/86; Order 76-6, § 296-350-050, filed 3/1/76; Order 75-14, § 296-350-350 (codified as WAC 296-350-050), filed 4/14/75; Order 74-21, § 296-350-050, filed 5/6/74.]

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WAC 296-350-060 Notices of reassumption of jurisdiction and informal conferences—Service—Posting record. Either the original or copies of the notice of reassumption of jurisdiction and the notice of informal conferences shall be forwarded by certified mail to all parties, or their representatives, with a copy to the employer at the premises of the employer affected by the appeal which shall be posted by the employer in a place or places reasonably accessible to all affected employees. In addition to the written notice of informal conference and reassumption of jurisdiction, the department may give telephonic or telegraphic notice of the time, date and place for any informal conference. The notice of informal conference shall in all cases advise that all appealing parties, as well as affected employees and representatives of affected employees, may either orally, or in writing, not later than the date fixed for such conference object to or support the subject matter of the reassumption of jurisdiction by the department. Informal conferences will ordinarily be held at the district office of the department most convenient to the appealing parties. The information presented by the participants at the informal conference and the arguments of the respective parties objecting to or supporting the subject matter of the reassumption of jurisdiction by the department shall be recorded either manually or by a mechanical device. Documentary or other types of physical materials presented at the informal conference shall be made a part of the record of the informal conference.

[Order 75-14, § 296-350-060, filed 4/14/75; Order 74-21, § 296-350-060, filed 5/6/74.]

WAC 296-350-070 Reassumption of jurisdiction—Informal conferences—Procedure—Evidence. (1) The director shall designate personnel of the staff of the division of consultation and compliance to act as presiding officers at informal conferences.

(2) A presiding officer shall be present and preside over the proceedings at all informal conferences conducted. He/she may be accompanied by an assistant attorney general who shall be able to render legal advice to the presiding officer. The assistant attorney general may, at the presiding officer's request, preside over the proceedings.

(3) Prior to the commencement of the informal conference, the presiding officer may confer with the parties to the informal conference concerning the material to be presented for the record in order to determine an orderly method of procedure. The designated presiding officer may admit and give probative effect to evidence which possesses probative value commonly accepted by reasonably prudent persons in the conduct of their affairs. Effect shall be given to the rules of privilege recognized by law. The presiding officer may exclude incompetent, irrelevant, immaterial and unduly repetitious evidence. Documentary evidence may be received in the form of copies of excerpts or by incorporation in the record by reference. Every party shall have the right to ask questions of other parties present. The designated presiding officer may take notice of judicially cognizable facts and in addition may take notice of general, technical, or scientific facts within the specialized knowledge of the department's officers relating to industrial safety and health.

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[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-350-070, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-070, filed 4/14/75; Order 74-21, § 296-350-070, filed 5/6/74.]

WAC 296-350-080 Reassumption of jurisdiction—Final determination—Mailing. (1) Immediately following the informal conference the presiding officer shall complete a status report of the reassumption of jurisdiction which shall include a summary of findings and conclusions and shall state therein the redetermination and final decision of the department. The presiding officer shall then complete and submit those documents which are necessary for the expeditious processing of these redeterminations and final decisions such that all corrective abatement, relating to the subject matter of the reassumption of jurisdiction, can be issued by the department within thirty working days of the determination to reassume jurisdiction over the subject matter of the appeal.

(2) Corrective notices issued following reassumption of jurisdiction shall be forwarded by certified mail or personal delivery or service. Upon receipt of a corrective notice of redetermination issued by the department pursuant to RCW 49.17.140(3), the employer shall immediately post the corrective notice of redetermination or a copy thereof in a prominent place at or near each place a violation referred to in the corrective notice of redetermination occurred. The corrective notice of redetermination or a copy thereof shall remain posted as required by this section until the violation(s) have been abated, or for three working days, whichever is longer.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 86-16-008 (Order 86-27), § 296-350-080, filed 7/25/86; 82-13-045 (Order 82-22), § 296-350-080, filed 6/11/82; Order 76-6, § 296-350-080, filed 3/1/76; Order 75-14, § 296-350-080, filed 4/14/75; Order 74-21, § 296-350-080, filed 5/6/74.]

WAC 296-350-090 Reassumption of jurisdiction—Statement of redetermination—Appeal. All corrective notices of assessment of penalty, citations or revised periods of abatement shall include a statement identifying the notice as having been issued according to the provisions of RCW 49.17.140(3) and that any appeal thereto must be made to the board of industrial insurance appeals, with a copy of the notice of appeal to be served on the department, within fifteen working days of the communication of the corrective notice, or the same shall be deemed a final order of the department and not subject to review by any court or agency.

[Order 75-14, § 296-350-090, filed 4/14/75; Order 74-21, § 296-350-090, filed 5/6/74.]

WAC 296-350-095 Settlement agreements. (1) Every settlement agreement in an appeal to the board of industrial insurance appeals shall contain a statement of the abatement date for the cited condition or a statement that the condition has been abated. If any settlement agreement lacks a statement of abatement date, the department shall assign an abatement date to the condition which allows the same amount of time for abatement as was allowed by the original abatement date; the amount of time for abatement shall be figured from the date that the board of industrial insurance appeals issues its order adopting the settlement agreement.

(2) Every settlement agreement shall contain a statement that payment of any penalty has been tendered or a statement of a promise to pay any penalty.

(1999 Ed.)

[Statutory Authority: RCW 49.17.040 and 49.17.050, 82-13-045 (Order 82-22), § 296-350-095, filed 6/11/82.]

WAC 296-350-200 Variances—Foreword. WAC 296-350-200 through 296-350-280 contain rules pursuant to which employers may apply for departmental orders granting variances from industrial safety and health standards in accordance with the provisions of RCW 49.17.080 and 49.17.090. Also included are rules on procedures to be followed by the director or his/her authorized representatives following the receipt of such an application for an order granting a variance.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-350-200, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-200, filed 4/14/75.]

WAC 296-350-210 Types of orders granting a variance. (1) Section 8 (RCW 49.17.080) and section 9 (RCW 49.17.090) of the Washington Industrial Safety and Health Act (chapter 80, Laws of 1973) provide for the granting of two types of orders granting a variance from industrial safety and health standards administered according to that chapter.

(2) RCW 49.17.080 authorizes the issuance of an order granting a variance (temporary) from any safety and health standard promulgated under the authority of the act upon proper application by the employer and sufficient showing by the applicant employer that the applicant employer is unable to comply with a safety and health standard because of unavailability of professional or technical personnel or materials and equipment needed to come into compliance with the safety and health standard or because necessary construction or alteration of facilities cannot be accomplished by the effective date of the standard, and that the employer is taking all available steps to safeguard his/her employees against the hazards covered by the safety and health standard and that the employer has an effective program for coming into compliance with the safety and health standard as quickly as practicable.

(3) RCW 49.17.090 authorizes the issuance of an order granting a variance (permanent) from any safety and health standard promulgated under the authority of the act upon proper application by the employer and sufficient showing by the applicant employer that the conditions, practices, means, methods, operations or processes used or proposed to be used by such applicant employer will provide employment and places of employment to his/her employees which are as safe and healthful as those which would prevail if the employer complied with the safety and health standard or standards from which the variance is sought.

[Statutory Authority: Chapter 49.17 RCW, 94-15-096 (Order 94-07), § 296-350-210, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-210, filed 4/14/75.]

WAC 296-350-230 Effect of variances. All variances granted pursuant to the provisions of this chapter shall have only future effect. In his/her discretion, the director or his/her authorized representative may decline to entertain an application for a variance on a subject or issue concerning which a citation has been issued to the employer involved and a proceeding on the citation or a related issue concerning a proposed penalty or period of abatement is pending before the

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board of industrial insurance appeals, or an appropriate court, until the completion of such proceeding.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-230, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-230, filed 4/14/75.]

WAC 296-350-240 Variance applications—Form of documents—Subscription. (1) No particular form is prescribed for applications and other papers which may be filed in proceedings relating to the application for an order granting a variance. However, any applications and other papers shall be clearly legible. Department forms for application for a variance may be used and may be obtained from the Division of Consultation and Compliance, Department of Labor and Industries, P.O. Box 44600 Olympia, Washington 98504-4600; or other offices of that division.

(2) Each application or other paper which is filed in proceedings relating to the application for an order granting a variance under this chapter shall be subscribed by the person filing the same or by his/her attorney or other authorized representative.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-240, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-240, filed 4/14/75.]

WAC 296-350-250 Order granting a temporary variance—Application. (1) Application for a temporary variance. Any employer desiring a variance from a standard, or portion thereof, authorized by section 8 of the act (RCW 49.17.080) may file a written application containing the information specified in this section with the Assistant Director of the Division of Consultation and Compliance, P.O. Box 44600, Olympia, Washington 98504-4600.

(2) Contents. An application filed pursuant to subsection (1) of this section shall include:

- (a) The name and address of the applicant;
- (b) The address of the place of employment involved;
- (c) A specification of the standard or portion thereof from which the applicant seeks a variance; to include a reference to the appropriate code section or sections;

(d) A representation by the applicant supported by representations from a qualified person or persons having first-hand knowledge of the facts represented, that he/she is unable to comply with the standard or portion thereof by its effective date and a detailed statement of the reasons therefor;

(e) A statement of the steps the applicant has taken and will take, with specific dates where appropriate, to protect employees against the hazard covered by the standard;

(f) A statement of when the applicant expects to be able to comply with the standard and of what steps he/she has taken and will take, with specific dates where appropriate, to come into compliance with the standard;

(g) A statement of the facts the applicant would show to establish that:

(i) The applicant is unable to comply with a standard by its effective date because of unavailability of professional or technical personnel or materials and equipment needed to come into compliance with the standard or because necessary construction or alteration of facilities cannot be completed by the effective date of the standard from which the variance is sought;

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(ii) He/she is taking all available steps to safeguard their employees against the hazards covered by the standard; and

(iii) He/she has an effective program for coming into compliance with the standard as quickly as practicable;

(h) Any request for a hearing, as provided in WAC 296-350-280;

(i) A statement that the applicant has informed their affected employees of the application by giving a copy thereof to their authorized representative, posting a statement, giving a summary of the application and specifying where a copy may be examined, at the place or places where notices to employees are normally posted, and by other appropriate means; and

(j) A description of how affected employees have been informed of the application and of their right to petition the director for a hearing.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-250, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-250, filed 4/14/75.]

WAC 296-350-255 Order granting a permanent variance—Application. (1) Application for a permanent variance. Any employer desiring a variance authorized by section 9 of the act (RCW 49.17.090) may file a written application containing the information specified in this section with the Assistant Director of Consultation and Compliance, P.O. Box 44600, Olympia, Washington 98504-4600.

(2) Contents. An application filed pursuant to subsection (1) of this section shall include:

- (a) The name and address of the applicant;
- (b) The address of the place of employment involved;
- (c) A specification of the standard or portion thereof from which the applicant seeks a variance; to include a reference to the appropriate code section or sections;

(d) A description of the conditions, practices, means, methods, operations, or processes used or proposed to be used by the applicant;

(e) A statement showing how the conditions, practices, means, methods, operations, or processes used or proposed to be used would provide employment and places of employment to employees which are as safe and healthful as those required by the standard from which a variance is sought;

(f) A certification that the applicant has informed his/her employees of the application by:

(i) Giving a copy thereof to their authorized representative;

(ii) Posting a statement giving a summary of the application and specifying where a copy may be examined, at the place or places where notices to employees are normally posted (or in lieu of such summary, the posting of the application itself); and

(iii) By other appropriate means.

(g) Any request for a hearing, as provided in WAC 296-350-280; and

(h) A description of how employees have been informed of the application and of their right to petition the director for a hearing.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-255, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014

(1999 Ed.)

(Order 80-20), § 296-350-255, filed 11/13/80; Order 75-14, § 296-350-255, filed 4/14/75.]

WAC 296-350-260 Interim order—Application—Notice of grant. (1) An application may also be made for an interim order to be effective until a decision is rendered on the application for the variance filed previously or concurrently. An application for an interim order may include statements of fact and arguments as to why the order should be granted. The director or his/her authorized representatives may rule ex parte upon the application.

(2) If an interim order is granted, a copy of the order shall be served upon the applicant for the order and other parties. It shall be a condition of the order that the employer shall give notice thereof to affected employees by the same means to be used to inform them of an application for a variance.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-260, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-260, filed 4/14/75.]

WAC 296-350-270 Notice of denial of application for variance. If an application for a variance filed pursuant to this chapter is denied, the applicant shall be given prompt notice of the denial, which shall include, or be accompanied by a brief statement of the grounds therefor.

[Order 75-14, § 296-350-270, filed 4/14/75.]

WAC 296-350-280 Hearings on applications for variances—Temporary and permanent. (1) Any affected employee or employees, or an authorized representative of affected employees may request of the assistant director of consultation and compliance that a hearing be held on the application for a temporary or permanent variance.

(2) The employer applicant or his/her representative may request of the assistant director of consultation and compliance that a hearing be held on the application for a temporary or permanent variance.

(3) Requests for hearings authorized by section 8 and 9 of the act (RCW 49.17.080 and 49.17.090) and subsections (1) and (2) of this section shall be in writing, signed by the applicant, and must be received by the assistant director of consultation and compliance within twenty-one calendar days of the date of the application for a variance.

(4) After receipt of a request for a hearing filed pursuant to these rules, the department, not later than ten working days from the date of the receipt of such request, shall issue a notice of hearing advising that the opportunity will be afforded to all interested parties as prescribed in this section to participate in a hearing on the application for a variance. The notice of hearing shall fix the time for such hearing, such that the affected parties can reasonably be expected to receive the NOTICE OF HEARING not less than twenty days in advance of the date set for the hearing, and shall indicate the time, date and place at which such hearing is to be conducted. Such notice of hearing shall be immediately communicated to affected employees by giving a copy thereof to their authorized representative and posting a copy thereof with the application for a variance or a summary of said application as prescribed in WAC 296-350-250 (2)(i) or (2)(f). In addition to the forwarding of the notice of hearing, the department

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may give telephonic or telegraphic notice of the time, date and place for any such hearing.

(5) The director shall designate department personnel to act as presiding officers at hearings on applications for variances.

(6) The duties of the presiding officer include but are not limited to the following:

(a) A presiding officer shall be present and preside over the proceedings at all hearings conducted. He/she may be accompanied by an assistant attorney general who shall be able to render legal advice to the presiding officer. The assistant attorney general may, at the presiding officer's request, preside over the proceedings.

(b) Prior to the commencement of the hearing, the presiding officer may confer with the parties attending the hearing concerning the material to be presented for the record in order to determine an orderly method of procedure. The designated presiding officer may admit and give effect to evidence which possesses probative value commonly accepted by reasonably prudent people in the conduct of their affairs. Effect shall be given to the rules of privilege recognized by law. The presiding officer may exclude incompetent, irrelevant, immaterial and unduly repetitious evidence. Documentary evidence may be received in the form of copies of exhibits or by incorporation in the record by reference. Every party shall have the right to ask questions of other parties present. The designated presiding officer may take notice of judicially cognizable facts, and in addition may take notice of general, technical or scientific facts within the specialized knowledge of the department's officers relating to industrial safety and health.

(c) All proceedings relating to a hearing under this section shall be recorded mechanically or otherwise. Copies of transcripts of such recordings will be made available to any party at cost upon request of the party.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-280, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-280, filed 11/13/80; Order 75-14, § 296-350-280, filed 4/14/75.]

WAC 296-350-350 Extension of abatement date(s)—Application—Authority. All sections of this chapter which include WAC 296-350-350 in the section number apply to the request of extension of abatement dates in accordance with the provisions of RCW 49.17.140(3), which reads in pertinent part:

"Upon application by an employer showing that a good faith effort to comply with the abatement requirements of a citation has been made and that the abatement has not been completed because of factors beyond his/her control, the director after affording an opportunity for a hearing shall issue an order affirming or modifying the abatement requirements in such citation."

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-350, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-350, filed 4/14/75.]

WAC 296-350-35010 Application for extension of abatement date(s). Applications for extensions of abatement dates shall be submitted in writing by the employer, or his/her

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representative, whose workplace is the subject of the **citation** containing the abatement date for which the extension(s) is (are) sought. Subject to the provisions of WAC 296-350-35015, applications received by telephone or personal non-written communication may be acted upon by the assistant director.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-35010, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35010, filed 11/13/80; Order 76-29, § 296-350-35010, filed 9/30/76; Order 75-14, § 296-350-35010, filed 4/14/75.]

WAC 296-350-35015 Extension of abatement date(s)—Application—Timeliness. (1) An application for the extension of an abatement date, or abatement dates, shall be considered a timely application if it is served on the division at any time prior to midnight of the abatement date for which the extension is sought.

(2) A later-filed application may be acted upon by the division if it is received by the division within five days following the relevant abatement date(s) and is accompanied by the employer's written statement of exceptional circumstances explaining the delayed filing: *Provided*, That such later-filed application shall not be acted upon if the department has initiated compliance activity regarding the relevant abatement date(s) prior to the receipt of the later-filed application for extension.

[Order 76-29, § 296-350-35015, filed 9/30/76; Order 75-14, § 296-350-35015, filed 4/14/75.]

WAC 296-350-35020 Extension of abatement date(s)—Application—Service. Service of the application may be accomplished by postage prepaid first class mail or by personal delivery. Service is deemed effected at the time of mailing (if by mail) or at the time of personal delivery (if by personal delivery).

[Order 75-14, § 296-350-35020, filed 4/14/75.]

WAC 296-350-35025 Extension of abatement date(s)—Application—Contents. (1) The application for an extension of an abatement date or dates shall include:

- (a) The name of the applicant employer;
- (b) The address of the workplace or workplaces to which the application applies;
- (c) Identification of the CITATION which includes the abatement date(s) for which an extension is sought;
- (d) Identification of the specific abatement date(s) for which an extension is sought;
- (e) A statement of the actions the employer has taken to attempt to comply with the subject abatement date(s);
- (f) An identification of those factors, beyond the control of the employer, which have prevented or will prevent the employer from complying with the subject abatement date(s);
- (g) The length(s) of time sought for the extension(s);
- (h) The means of protecting employees during time employer is coming into compliance.

[Order 75-14, § 296-350-35025, filed 4/14/75.]

WAC 296-350-35030 Extension of abatement date(s)—Provisional determination. Upon receipt of the application the assistant director shall make a provisional

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determination to extend the subject abatement date(s) or to deny the application. The assistant director may conduct whatever investigation he/she deems proper prior to making the determination. The determination shall be in effect unless a hearing is requested in accordance with the provisions of these rules.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35030, filed 11/13/80; Order 75-14, § 296-350-35030, filed 4/14/75.]

WAC 296-350-35035 Extension of abatement date(s)—Notice of application—Notice of opportunity for hearing—Notice of provisional determination. (1) Following the making of the provisional determination according to WAC 296-350-35030 but no later than five working days after the receipt of the application the assistant director shall issue the following notices:

- (a) A notice of receipt of the application, which shall include reference to the subject abatement dates;
 - (b) A notice of opportunity for a hearing on the application;
 - (c) A notice of provisional determination on the application.
- (2) The assistant director may combine the notices required by the section on one document.
- (3) The notices required by this section shall be signed by the assistant director, shall include the date of issuance by the assistant director and shall include the address to which requests for a hearing, if any, shall be sent.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35035, filed 11/13/80; Order 75-14, § 296-350-35035, filed 4/14/75.]

WAC 296-350-35040 Extension of abatement date(s)—Posting. (1) Immediately upon receipt, the notices issued in accordance with WAC 296-350-35035 shall be posted with the CITATION or CITATIONS which include the abatement date(s) for which an extension(s) is sought.

(2) The notices issued in accordance with WAC 296-350-35035 shall remain posted until the provisional abatement date(s) identified on the notice, or if a hearing is requested pursuant to WAC 296-350-35045, until a notice for hearing on the application for extension is posted.

[Order 75-14, § 296-350-35040, filed 4/14/75.]

WAC 296-350-35045 Extension of abatement date(s)—Application for hearing. (1) A hearing on the application for extension of abatement(s) may be applied for by the employer, an affected employee or employees of the employer or an authorized representative of such affected employees.

(2) Applications for hearings on application for extension of abatement date(s) shall be made to the assistant director at the address identified on the notice(s) issued pursuant to WAC 296-350-35035.

(3) Applications for hearings shall be served on the assistant director, according to the provisions of WAC 296-350-35020, at the address identified in the applicable notice not later than ten calendar days following the issuance of the notice.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35045, filed 11/13/80; Order 75-14, § 296-350-35045, filed 4/14/75.]

WAC 296-350-35050 Extension of abatement date(s)—Notice of hearing. (1) Upon receipt of a request for a hearing filed in accordance with WAC 296-350-35045 the assistant director shall issue a notice of hearing to the applicant and the employer stating that the opportunity will be afforded to all interested parties to participate in a hearing on the application for an extension of abatement date(s).

(2) The **notice of hearing** shall fix the time and date for such hearing such that the parties can reasonably be expected to receive the **notice of hearing** not less than twenty days in advance of the date set for the hearing.

(3) The **notice of hearing** shall state the time, place, and nature of the proceeding; the legal authority and jurisdiction under which the hearing is to be held; a reference to the particular sections of the statute and the rules involved; and a short and plain statement of the matters asserted.

(4) The **notice of hearing**, or a complete copy thereof, shall be posted by the employer with the **citation** containing the abatement date(s) for which an extension is sought and the notice(s) issued in accordance with WAC 296-350-35035, and shall remain posted until the date and time set for the hearing.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35050, filed 11/13/80; Order 75-14, § 296-350-35050, filed 4/14/75.]

WAC 296-350-35055 Extension of abatement date(s)—Hearings. (1) The assistant director shall designate department personnel to act as hearing officers at hearings on applications for extension of abatement date(s).

(2) A hearing officer shall be present and preside over the proceedings at all hearings conducted. The hearing officer may be accompanied by an assistant attorney general who shall be able to render legal advice to the hearing officer. The assistant attorney general may, at the hearing officer's request, preside over the proceedings.

(3) Prior to the commencement of the hearing, the hearing officer may confer with the parties attending the hearing concerning the material to be presented for the record in order to determine an orderly method of procedure.

(4) The provisions of chapter 34.04 RCW are applicable to hearings conducted pursuant to the provisions of this section.

(5) All proceedings relating to a hearing under this section shall be recorded mechanically or otherwise. Copies of transcripts of such recordings will be made available to any parties involved, upon request therefore and payment of the reasonable costs thereof.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-35055, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-13-045 (Order 82-22), § 296-350-35055, filed 6/11/82. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35055, filed 11/13/80; Order 75-14, § 296-350-35055, filed 4/14/75.]

WAC 296-350-35060 Extension of abatement date(s)—Decision and order. (1) Following the conclusion of a hearing conducted pursuant to the provisions of this sec-

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tion, the assistant director shall issue an order affirming or modifying the abatement date(s) which is the subject of the application for extension of abatement date(s). Such order shall be in conformance with the provisions of chapter 34.04 RCW and chapter 296-08 WAC relating to practice and procedure in contested cases, as now or hereafter amended.

(2) A complete and unedited copy of the order issued pursuant to subsection (6) of this section shall be posted, immediately upon receipt, with the CITATION or CITATIONS which include the abatement date(s) to which the order applies.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-35060, filed 11/13/80; Order 75-14, § 296-350-35060, filed 4/14/75.]

WAC 296-350-400 Posting of notices—Posting of citation and notice—Availability of act and applicable standards. (1) Definitions. The definitions of WAC 296-350-010 and 296-27-020 shall apply to this section.

(2) Each employer shall post and keep posted a notice or notices (the WISHA poster, Job safety and health protection, F416-081-000) to be furnished by the division of consultation and compliance, department of labor and industries, informing employees of the protections and obligations provided for in the act and that for assistance and information, including copies of the act, and of specific safety and health standards employees should contact the employer or the nearest office of the department of labor and industries. Such notice or notices shall be posted by the employer at each establishment in a conspicuous place or places where notices to employees are customarily posted. Each employer shall take steps to assure that such notices are not altered, defaced or covered by other material.

(3) The notice identified in subsection (2) of this section shall be posted in each establishment of the employer as defined in WAC 296-27-020(8).

(4) All notices required to be posted by provisions of the act, provisions of this chapter or the provisions of any other safety and health standard, rule or regulation adopted pursuant to the authority of the act, shall be posted as required by this section, or as required by the act, or as required by the provision of the applicable safety and health standard, rule or regulation.

(5) Unless otherwise specified in this section, the act, or the applicable safety and health standard, rule or regulation, notices or other materials required to be posted, shall be posted in each establishment of the employer, as defined in WAC 296-27-020(8).

(6) Copies of the act, all regulations published in this chapter and all applicable standards shall be available at all regional offices of the department of labor and industries. If an employer has obtained copies of these materials, he/she shall make them available upon request to any employee or his/her authorized representative on the same day the request is made, or at the earliest time mutually convenient to the employee or his/her authorized representative and the employer, for review by the requesting employee or authorized representative.

(7) Any employer failing to comply with the provisions of this section shall be subject to citation and penalty in

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accordance with the provisions of section 12 and 18 of the act. (RCW 49.17.120 and 49.17.180.)

(8) Documents required to be posted include, but shall not be limited to the following:

(a) A copy or copies of an application or applications for a variance or variances from any safety and health standards applied for in accordance with RCW 49.17.080 or 49.17.090 shall be posted at each establishment to which the variance, if granted, will apply. The manner of posting such applications shall be in accordance with subsections (4) and (5) of this section.

(b) Upon receipt of any **citation and notice** issued by the department pursuant to RCW 49.17.120 or 49.17.130, the employer shall immediately post the **citation and notice** or a copy thereof in a prominent place at or near each place a violation referred to in the **citation and notice** occurred. Where, because of the nature of the employer's operations, it is not practicable to post the **citation and notice** or a copy thereof at or near each place of violation, the **citation and notice** or a copy thereof shall be posted in the establishment of the employer, as defined in WAC 296-27-020(8).

The posted **citation and notice** or copy thereof shall be complete and shall not be abstracted, edited or otherwise changed from the original. The posted **citation and notice** or copy thereof shall be readily visible, and shall not be defaced or covered by other material.

The **citation and notice** or copy thereof shall remain posted as required by this subsection until all violations have been abated, or for three working days, whichever is longer. Whenever an employer verifies abatement of a violation in writing, see WAC 296-27-16009, a copy of the written verification shall be posted with the **citation and notice** for at least three working days.

(c) A copy of the notice of filing of appeal pursuant to RCW 49.17.140, the notice of conference pursuant to WAC 263-12-090, and the notice of hearing pursuant to WAC 263-12-100 shall be posted by the employer at each establishment to which the notices apply in a conspicuous place or places where notices to employees are customarily posted. The manner of posting such notices shall be in accordance with subsections (4) and (5) of this section.

(d) In the event that a proposed agreement settling an appeal of a citation and notice to the board of industrial insurance appeals is reached between the employer and the department without the concurrence of the affected employees or employee groups, a copy of the proposed agreement shall be posted by the employer at each establishment to which the agreement applies in a conspicuous place or places where notices to employees are customarily posted. The agreement shall be posted for 10 days before it is filed with the board of industrial insurance appeals. The manner of posting shall be in accordance with subsections (4) and (5) of this section.

(e) Notices required to be posted by specific provisions of any safety and health standard or other rule or regulation duly adopted by the director shall be posted according to the standard, rule or regulation requiring such posting. If the provision containing the requirement for posting does not specify the manner of posting, such posting shall conform to the requirements of subsections (4) and (5) of this section.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-400, filed 7/20/94, effective 9/20/94; 91-24-017 (Order 91-07), § 296-350-400, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-350-400, filed 1/17/86; 82-13-045 (Order 82-22), § 296-350-400, filed 6/11/82; Order 75-14, § 296-350-400, filed 4/14/75. Formerly WAC 296-27-200.]

WAC 296-350-450 Complaints by employees or their representatives. (1) Any employee or representative of employees who in good faith believes that a violation of any safety or health standard or an imminent danger exists in any workplace where such employee is employed may request an inspection of such workplace by giving notice of the alleged violation or danger to any office or officer of the division of consultation and compliance of the department. Any such notice shall be reduced to writing, shall set forth with reasonable particularity the grounds for the notice, and shall be signed by the employee or representative of employees. A copy shall be provided the employer or his/her agent by an officer of the division no later than at the time of inspection, if any, except that upon the request of the person giving such notice, his/her name and the names of individual employees referred to therein shall not appear in such copy or on any record published, released, or made available by the department of labor and industries.

(2) If upon receipt of such notification it is determined that the complaint meets the requirements set forth in subsection (1) of this section, and that there are reasonable grounds to believe that the alleged violation or danger exists, an inspection shall be made as soon as practicable, to determine if such alleged violation or danger exists. Inspections under this section may extend beyond the matters referred to in the complaint.

(3) Prior to or during any inspection of a workplace, any employee or representative of employees employed in such workplace may notify the inspector, in writing, of any violation of the act or safety or health standard he/she has reason to believe exists in such workplace. Any such notice shall comply with the requirements of subsection (1) of this section.

(4) RCW 49.17.160(1) provides: "No person shall discharge or in any manner discriminate against any employee because such employee has filed any complaint or instituted or caused to be instituted any proceeding under or related to this chapter or has testified or is about to testify in such proceeding or because of the exercise of such employee on behalf of himself or others of any right afforded by this chapter."

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-450, filed 7/20/94, effective 9/20/94; Order 75-14, § 296-350-450, filed 4/14/75.]

WAC 296-350-460 Complaints—Inspection not warranted—Informal review. (1) If it is determined that an inspection is not warranted because there are no reasonable grounds to believe that a violation or danger exists with respect to a complaint received pursuant to WAC 296-350-450, the complaining party shall be notified in writing of such determination. The complaining party may obtain informal review of such determination by submitting a written statement of position with the assistant director requesting such review. Upon the request of the complaining party, the assis-

tant director or his/her designee, at his/her discretion, may hold an informal conference in which the complaining party may present his/her views orally or in writing. After considering all written and oral views presented, the assistant director or his/her designee shall affirm, modify, or reverse the original determination and furnish the complaining party with written notification of his/her decision and the reasons therefor.

(2) If the assistant director or his/her designee, determines that an inspection is not warranted because the requirements of WAC 296-350-460(1) have not been met, he/she shall notify the complaining party in writing of such determination. Such determination shall be without prejudice to the filing of a new complaint meeting the requirements of WAC 296-350-460(1).

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-460, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-460, filed 11/13/80; Order 75-41, § 296-350-460, filed 12/19/75; Order 75-14, § 296-350-460, filed 4/14/75.]

WAC 296-350-470 Citation not issued following complaint. (1) If a citation or notice of de minimis violations is issued for a violation alleged in a request for inspection under WAC 296-350-450(3), a copy of the citation or notice of de minimis violations shall also be sent to the employee or representative of employees who gave such notification.

(2) After an inspection, if it is determined that a citation is not warranted with respect to a danger or violation alleged to exist in a request for inspection under WAC 296-350-360(1), or a notification of violation under WAC 296-350-450(3), the informal review procedures prescribed in WAC 296-350-460(1) shall be applicable. After considering all views presented, the assistant director or his/her designee, shall affirm the determination, order a reinspection, or issue a citation if he/she believes that the inspection disclosed a violation.

(3) The assistant director or his/her designee shall furnish the complaining party and the employer with written notification of his/her determination and the reasons therefor.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-470, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-470, filed 11/13/80; Order 75-14, § 296-350-470, filed 4/14/75.]

WAC 296-350-500 Citation and notice—Copy to employee representative. (1) RCW 49.17.120 provides in pertinent part

"The director shall provide by rule for procedures to be followed by an employee representative upon written application to receive copies of **citations and notices** issued to any employer having employees who are represented by such employee representative. Such rule may prescribe the forms of such application, the time for renewal of applications, and the eligibility of the applicant to receive copies of **citations and notices**."

(2) "Employee representative" means:

(a) Any officer of the recognized bargaining agent of employees, acting on behalf of the employees of the employer.

(b) Any employee representative of an employer-employee safety committee within an establishment or the firm of the employer.

(c) Any employee of an employer who has been selected by the employees of that employer to act as their representative for the purposes indicated in subsection (1) of this section. Such selection shall be evidenced by a letter or other written communication to the division of consultation and compliance stating the name of the employee so selected and signed by not less than one-half of the employees of the employer so represented.

(3) An employee representative may receive copies of **citations and notices** issued to any employer having employees who are represented by such employee representative upon the filing of a complete application Form F418-023-000, a facsimile of which constitutes Appendix A of this section, with the Division of Consultation and Compliance, Department of Labor and Industries, P.O. Box 44600 Olympia, Washington 98504-4600.

(4) In the event that the director or his/her authorized representative finds that application for copies of the **citation and notice** have been received by more than one employee representative of the same employees of the employer, the director or his/her authorized representative may elect which of the applicants to which the copies of the **citation and notice** shall be sent.

(5) The director or his/her authorized representative may deny an application for copies of **citations and notices** upon finding that the applicant is not an employee representative as defined in subsection (2) of this section or upon finding that more than one employee representative of the same employees has applied for copies of **citations and notices**.

(6) An application for copies of **citations and notices** may be granted for a period not exceeding one year and may be renewed upon re-application for another one year period. The director or his/her authorized representative may, at the request of the applicant, waive the one year limitation.

(7) Upon the granting of the application for copies of **citations and notices**, the applicant shall be informed of the granting and of the date on which that grant shall expire.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-350-500, filed 7/20/94, effective 9/20/94; 87-24-051 (Order 87-24), § 296-350-500, filed 11/30/87. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-500, filed 11/13/80; Order 75-14, § 296-350-500, filed 4/14/75.]

WAC 296-350-990 Appendix A—Form F418-023-000—Application for copies of citations and notices.

APPENDIX A

DEPT. OF LABOR & INDUSTRIES
Div. of Industrial Safety & Health
P.O. Box 207
Olympia, WA 98504

APPLICATION FOR COPIES OF CITATION AND NOTICES
ISSUED PURSUANT TO THE WASHINGTON INDUSTRIAL SAFETY AND HEALTH ACT

Any employee of an employer who has been selected by the employees of that employer to act as their representative as defined in WAC 296-350-500 may apply for copies of CITATION AND NOTICES issued to said employer.

DEFINITION:

WAC 296-350-500(2) - "Employee representative" means:

- (a) Any officer of the recognized bargaining unit of employees, acting on behalf of the employees of the employer.
- (b) Any employee representative of an employer-employee safety committee within an establishment of the firm of the employer.
- (c) Any employee of an employer who has been selected by the employees of that employer to act as their representative for the purposes indicated in subsection (1) of this section. Such selection shall be evidenced by a letter or other written communication to the Division of Industrial Safety and Health stating the name of the employee so selected and signed by not less than one-half of the employees of the employer.

Applicant certifies he/she is an employee representative by virtue of WAC 296-350-500(2)

CERTIFICATION: I HEREBY CERTIFY UNDER PENALTY OF PERJURY THAT THE ABOVE STATEMENT IS TRUE TO THE BEST OF MY KNOWLEDGE.

Signature	position	date
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Name and address of applicant to which copies of CITATION AND NOTICES should be sent:

Name, address and Labor & Industries account I.D. and/or Unified Business Identifier of EMPLOYER HAVING EMPLOYEES WHO ARE REPRESENTED by the applicant (please give full information for each employer you represent - use extra paper if required):

The director or his/her authorized representative may deny this application if more than one employee representative has applied or if the applicant does not qualify as an employee representative.

For Department Use Only		
Application Rcvd. _____	Application Granted by _____	Date Application Granted _____
Applicant Notified _____	Expiration Date _____	
Comment:		

F418-023-000 app for copies of citation and notice 4-87 (Wish 300)

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-350-990, filed 11/30/87. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-990, filed 11/13/80; Order 75-14, Appendix A—Form 300 (codified as WAC 296-350-990), filed 4/14/75.]

Chapter 296-360 WAC

DISCRIMINATION, PURSUANT TO RCW 49.17.160

WAC

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296-360-150	Discrimination because of exercise of right afforded by WISHA—Refusal to work in an unsafe condition.
296-360-160	Payment of damages to employee discriminated against.
296-360-170	Employee's refusal to comply with safety rules.

WAC 296-360-005 Definitions. For the purposes of this chapter.

(1) "Assistant director" - the assistant director for the division of consultation and compliance.

(2) "Division" - the division of consultation and compliance of the department of labor and industries.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-360-005, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-005, filed 11/13/80.]

WAC 296-360-010 Introduction. (1) Chapter 49.17 RCW, the Washington Industrial Safety and Health Act (WISHA), is designed to regulate employment conditions affecting industrial safety and health and to achieve safer and healthier work places throughout the state. WISHA requires every person who has employees to furnish each of his or her employees employment and a place of employment free from recognized hazards that are causing or likely to cause death or serious physical harm, and to comply with industrial safety and health standards promulgated under WISHA.

(2) Employees and representatives of employees are afforded a wide range of substantive and procedural rights under WISHA. Effective implementation of WISHA and achievement of its goals depend in large part upon the active but orderly participation of employees, individually and through their representatives.

(3) This chapter deals essentially with the rights of employees afforded under RCW 49.17.160. RCW 49.17.160 prohibits reprisals, in any form, against employees who exercise rights under WISHA. The purpose of this chapter is to make available in one place interpretations of the various provisions of section 16 of WISHA that will guide the assistant director in the performance of his or her duties thereunder.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-010, filed 11/13/80.]

WAC 296-360-020 General requirements of RCW 49.17.160 of WISHA. RCW 49.17.160 provides that no per-
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son shall discharge or in any manner discriminate against any employee because the employee has filed any complaint under or related to WISHA, instituted or caused to be instituted any proceeding under or related to WISHA, testified or is about to testify in any proceeding under or related to WISHA, or exercised on his or her own behalf or on behalf of others any right afforded by WISHA. Any employee who believes that he/she has been discriminated against in violation of section 16 of WISHA may, within thirty days after the violation occurs, file a complaint with the assistant director alleging the violation. The division shall investigate the complaint and, if the assistant director determines that section 16 of WISHA has been violated, the division may bring a civil action against the violator in superior court. The suit may ask the court to restrain violations of RCW 49.17.160 and to grant other appropriate relief, including rehiring or reinstating the employee to his or her former position with back pay.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-020, filed 11/13/80.]

WAC 296-360-030 Filing a complaint of discrimination. (1) Who may file. A complaint of RCW 49.17.160 discrimination may be filed by the employee him- or herself, or by a representative authorized to do so on his or her behalf.

(2) Nature of filing. No particular form of complaint is required.

(3) Place of filing. The complaint should be filed with the division.

(4) Time for filing. RCW 49.17.160(3) provides that an employee who believes that he or she has been discriminated against in violation of RCW 49.17.160 "may, within thirty days after such violation occurs" file a complaint with the assistant director. A major purpose of the thirty-day period is to allow the assistant director to decline to entertain complaints that have become stale. Accordingly, the division will presume that complaints not filed within thirty days of an alleged violation are untimely. There may be circumstances, however, that justify tolling the thirty-day period on recognized equitable principles or because strongly extenuating circumstances exist, e.g., where the employer has concealed, or misled the employee regarding the grounds for, discharge or other adverse action. In the absence of circumstances justifying a tolling of the thirty-day period, the division shall not accept untimely complaints.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 82-13-045 (Order 82-22), § 296-360-030, filed 6/11/82. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-030, filed 11/13/80.]

WAC 296-360-040 Notification of assistant director's determination. (1) RCW 49.17.160(3) provides that the assistant director is to notify a complainant within ninety days of the complaint of his determination whether prohibited discrimination has occurred. This ninety-day provision is directory, not mandatory. Although every effort will be made to notify complainants of the assistant director's determination within ninety days, there may be instances when it is not possible to do so.

(2) If a complainant receives a determination from the assistant director that prohibited discrimination has not occurred, the complainant may file a written request for

review by the director within fifteen working days of receipt of the determination. The request for review must set forth the basis for the request. The request shall be filed by mailing or delivering the request to the Director of Labor and Industries, P.O. Box 44000, Olympia, Washington 98504-4000. Upon review the director may set aside the assistant director's determination, remand the matter for further investigation, or affirm the determination of the assistant director. The director shall notify the complainant of the decision after review.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-360-040, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040 and 49.17.050. 85-10-004 (Order 85-09), § 296-360-040, filed 4/19/85. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-040, filed 11/13/80.]

WAC 296-360-050 Withdrawal of complaint. Enforcing the provisions of RCW 49.17.160 is not only a matter of protecting rights of individual employees, but also of protecting the public interest. Attempts by an employee to withdraw a filed complaint will not necessarily result in termination of the division's investigation. The division's jurisdiction cannot be foreclosed as a matter of law by unilateral action of the employee. However, a voluntary and uncoerced request from a complainant to withdraw his/her complaint shall generally be accepted.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-360-050, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-050, filed 11/13/80.]

WAC 296-360-060 Arbitration or other agency proceedings. (1) General.

(a) An employee who files a complaint under RCW 49.17.160 may pursue remedies under grievance arbitration proceedings in collective bargaining agreements, and may also resort to other agencies, such as the National Labor Relations Board, for relief. The division's jurisdiction to entertain RCW 49.17.160 complaints, to investigate, and to determine whether discrimination has occurred, is independent of the jurisdiction of other agencies or bodies. The division may file an action in superior court regardless of the pendency of other proceedings.

(b) Where it is possible, however, the division favors voluntary resolution of disputes under procedures in collective bargaining agreements. Also, the division should defer to the jurisdiction of other forums established to resolve disputes that may also be related to RCW 49.17.160 complaints. Thus, where a complainant is pursuing remedies other than those provided by RCW 49.17.160 it may be proper to postpone the assistant director's determination whether discrimination has occurred, and defer to the results of such proceedings.

(2) Postponement of determination. Postponement of determination is justified where the rights asserted in other proceedings are substantially the same as rights under RCW 49.17.160 and those proceedings are not likely to violate the rights guaranteed by RCW 49.17.160. The factual issues in the such proceedings must be substantially the same as those raised by the RCW 49.17.160 complaint, and the forum hearing the matter must have the power to determine the ultimate issue of discrimination.

(3) Deferral to outcome of other proceedings. Determinations to defer to the outcome of another proceeding begun by a complainant must be made after careful scrutiny. It must be clear that the proceeding dealt adequately with all factual issues, that it was fair, regular, and free of procedural infirmities, and that its outcome did not violate the purpose and policy of WISHA. If another action begun by a complainant is dismissed without an adjudicatory hearing on the merits, the division will not necessarily regard the dismissal as determinative of the merits of the RCW 49.17.160 complaint.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-060, filed 11/13/80.]

WAC 296-360-070 Persons prohibited from discriminating. RCW 49.17.160 specifically states that "no person shall discharge or in any manner discriminate against any employee" because the employee has exercised rights under WISHA. RCW 49.17.020(5), defines "person" as "one or more individuals, partnerships, associations, corporations, business trusts, legal representatives, or any organized group of persons." Consequently, the prohibitions of RCW 49.17.160 are not limited to actions taken by employers against their own employees. A person may be charged with discriminating against an employee of another person. RCW 49.17.160 extends to such entities as organizations representing employees in collective bargaining, employment agencies, or any other person in a position to discriminate against an employee. See *Meek v. United States*, 136 F.2d 679 (6th Cir., 1943); *Bowe v. Judson C. Burns*, 137 F.2d 37 (3rd Cir., 1943).

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-070, filed 11/13/80.]

WAC 296-360-080 Persons protected by RCW 49.17.160. (1) All employees are afforded the full protection of RCW 49.17.160. WISHA defines an employee as "an employee of an employer who is employed in a business of his/her employer which affects commerce." RCW 49.17.020(4). WISHA does not define "employ"; however, the broad remedial nature of WISHA demonstrates a clear intent that the existence of an employment relationship, for purposes of RCW 49.17.160, is to be based upon economic realities rather than upon common law doctrines and concepts. See *U.S. v. Silk*, 331 U.S. 704 (1947); *Rutherford Food Corporation v. McComb*, 331 U.S. 722 (1947).

(2) For purposes of RCW 49.17.160, an applicant for employment could be considered an employee. See *NLRB v. Lamar Creamery*, 246 F.2d 8 (5th Cir., 1957).

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-360-080, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-080, filed 11/13/80.]

WAC 296-360-090 Unprotected activities distinguished. (1) An employer or others may base actions that adversely affect an employee upon nondiscriminatory grounds. An employee's engagement in activities protected by WISHA does not automatically render him/her immune from discharge or discipline for legitimate reasons, or from adverse action dictated by nonprohibited considerations. See

NLRB v. Dixie Motor Coach Corp. 128 F.2d 201 (5th Cir., 1942).

(2) To establish a violation of RCW 49.17.160, the employee's engagement in protected activity need not be the sole consideration behind discharge or other adverse action. If protected activity was a substantial reason for the action, or if the discharge or other adverse action would not have taken place "but for" the employee's engagement in protected activity, RCW 49.17.160 has been violated.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-360-090, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-090, filed 11/13/80.]

WAC 296-360-100 Discrimination because of a complaint under or related to WISHA. RCW 49.17.160 prohibits discharge of, or discrimination against, an employee because the employee has filed any complaint under or related to this act.

(1) An example of a complaint made "under" WISHA would be an employee request for inspection pursuant to section 11 (RCW 49.17.110). This is not the only type of complaint protected by RCW 49.17.160, however. The range of complaints "related to" WISHA is commensurate with the broad remedial purposes of this legislation and the sweeping scope of its application.

(2) Complaints registered with other state or federal agencies that have the authority to regulate or investigate industrial safety and health conditions are complaints "related to" WISHA.

(3) The protection offered employees by WISHA would be seriously undermined if employees were discouraged from lodging complaints about industrial safety and health matters with their employers. Complaints to employers, if made in good faith, are related to WISHA, and an employee is protected against discharge or discrimination caused by a complaint to the employer.

(4) To come within the protection of RCW 49.17.160, a complaint must relate to conditions at the work place, as distinguished from complaints touching only upon general public safety and health.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-100, filed 11/13/80.]

WAC 296-360-110 Discrimination because of a proceeding under or related to the act. (1) RCW 49.17.160 prohibits discharge of, or discrimination against, any employee because the employee has "instituted or caused to be instituted any proceeding under or related to WISHA." Proceedings that can arise specifically under WISHA include inspections of worksites under RCW 49.17.070, employee contest of an abatement date under RCW 49.17.140, employee initiation of proceedings for promulgation of an industrial safety and health standard, employee application for modification or revocation of a variance under RCW 49.17.080, employee judicial challenge of a standard, and employee appeal of board of industrial insurance appeals order under RCW 49.17.140. In determining whether a "proceeding" is "related to" WISHA, the considerations discussed in WAC 296-360-100 are also applicable.

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(2) An employee need not directly institute a proceeding. It is sufficient if he or she sets into motion acts of others that result in proceedings under or related to WISHA.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-110, filed 11/13/80.]

WAC 296-360-120 Discrimination because of testimony. RCW 49.17.160 prohibits discharge of, or discrimination against, any employee because the employee "has testified or is about to testify" in proceedings under or related to WISHA. This protection is not limited to testimony in proceedings instituted or caused to be instituted by the employee, but extends to any statements given in the course of judicial, quasijudicial, and administrative proceedings, including inspections, investigations, administrative adjudications, and rules hearings.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-120, filed 11/13/80.]

WAC 296-360-130 Discrimination because of exercise of any right afforded by WISHA—In general. In addition to protecting employees who file complaints, institute proceedings, or testify in proceedings under or related to WISHA, RCW 49.17.160 also protects employees from discrimination occurring because of the exercise "of any right afforded by this chapter." Certain rights are explicitly stated in WISHA. Other rights exist by necessary implication. For example, employees may request information from the occupational safety and health administration or the department of labor and industries. Also, employees interviewed by agents of the division in the course of inspections or investigations cannot subsequently be discriminated against because of their cooperation.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-130, filed 11/13/80.]

WAC 296-360-140 Discrimination because of exercise of right afforded by WISHA—Walkaround pay. Employee participation in walkaround inspections under RCW 49.17.100 is essential. Employees are a vital source of information to the division about work place hazards. Employees must be able freely to exercise their statutory right to participate in walkarounds without fear of economic loss, such as the denial of pay for the time spent helping WISHA inspectors during the walkaround. To ensure the unimpeded flow of information to the inspectors, and the unfettered statutory right of employees to participate in walkaround inspections, an employer's failure to pay employees for time they spend in walkaround inspections is discrimination under RCW 49.17.160. In addition, an employer's failure to pay employees for time spent in other inspection-related activities, such as answering questions of inspectors or participating in the opening and closing conferences, is discrimination under RCW 49.17.160.

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-360-140, filed 7/20/94, effective 9/20/94. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-140, filed 11/13/80.]

WAC 296-360-150 Discrimination because of exercise of right afforded by WISHA—Refusal to work in an

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unsafe condition. (1) Review of WISHA and examination of the legislative history discloses that, as a general matter, WISHA grants no specific right to employees to walk off the job because of potential unsafe conditions at the work place. A hazardous condition that may violate WISHA will ordinarily be corrected by the employer, once brought to its attention. If the employer does not correct a hazard, or if there is a dispute about the existence of a hazard, the employee normally can ask the division to inspect the work place pursuant to RCW 49.17.110, or can seek help from other public agencies that have responsibility for safety and health. Under such circumstances, an employer would not violate RCW 49.17.160 by disciplining an employee who refuses to work because of an alleged safety or health hazard.

(2) Occasions arise, however, when an employee is confronted with a choice between not performing assigned tasks or subjecting him- or herself to serious injury or death arising from a hazard at the work place. If the employee, with no reasonable alternative, refuses in good faith to expose him- or herself to the dangerous condition, he or she is protected against subsequent discrimination.

(3) An employee's refusal to work is protected if he or she meets the following requirements:

(a) The refusal to work must be in good faith, and must not be a disguised attempt to harass the employer or disrupt the employer's business;

(b) The hazard causing the employee's apprehension of death or injury must be such that a reasonable person, under the circumstances then confronting the employee, would conclude that there is a real danger of death or serious injury; and

(c) There must be insufficient time, due to the urgency of the situation, to eliminate the danger through resort to regular statutory enforcement channels.

(4) As indicated in subsection (3), an employee's refusal to work is not protected unless it is a good faith response to a hazardous condition. To determine whether an employee has acted in good faith, the division will consider, among other factors, whether the employee:

(a) Asked the employer to correct the hazard;

(b) Asked for other work;

(c) Remained on the job until ordered to leave by the employer; or

(d) Informed the employer that, if the hazard was not corrected, the employee would refuse to work.

The lack of one or more of these factors shall not necessarily preclude a finding of good faith if other factors do establish good faith. The division will also consider whether the employer knew that the hazard could cause serious injury or death, or that the hazard was prescribed by a specific safety standard promulgated under WISHA or any other law that relates to the safety and health of a place of employment.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-150, filed 11/13/80.]

WAC 296-360-160 Payment of damages to employee discriminated against. (1) If an employer discriminates against an employee such that the employee earns less than he or she would have earned absent the discrimination, the employer shall pay the employee the difference between the wages that the employee would have earned absent the dis-

crimination and the wages the employee actually earned after the discrimination.

(2) If an employer discriminates against an employee for a refusal to work that is protected under WAC 296-360-150, the employer need not pay the employee's wages for the time spent fixing the hazard, or that would have been spent fixing the hazard, if the employer (a) had to or would have had to shut down the job to make the repair and (b) had not other work the employee could have done.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-160, filed 11/13/80.]

WAC 296-360-170 Employee's refusal to comply with safety rules. An employee who refuses to comply with industrial safety and health standards or valid safety rules implemented by the employer in furtherance of WISHA is not exercising a right afforded by WISHA. Discipline taken by employers solely in response to an employee's refusal to comply with appropriate safety rules and regulations is not discrimination prohibited by RCW 49.17.160. This situation should be distinguished from refusals to work discussed in WAC 296-360-150.

[Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-360-170, filed 11/13/80.]

Chapter 296-400A WAC

CERTIFICATION OF COMPETENCY FOR JOURNEYMAN PLUMBERS

(Formerly chapter 296-400 WAC)

WAC

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WAC 296-400A-005 What definitions do I need to know to understand these rules? Unless a different meaning is clearly required by the context, the following terms and definitions are important:

"**Advisory board**" is the state advisory board of plumbers.

"**Continuity affidavit**" is a form developed by the department that is used to verify whether medical gas pipe installation work has been performed. This form is provided to the department annually by the person holding the medical gas piping installer endorsement and requires the signature of the employer of the medical gas piping installer.

"**Department**" is the department of labor and industries.

"**Director**" is the director of the department of labor and industries.

"**Journeyman plumber**" is anyone who has learned the commercial plumbing trade and has been issued a journeyman certificate of competency by the department. A journeyman plumber may work on plumbing projects including residential, commercial and industrial worksite locations.

"**Medical gas piping installer**" is anyone who has been issued a medical gas piping installer endorsement of competency by the department.

"**Medical gas piping systems**" are piping systems that convey or involve oxygen, nitrous oxide, high pressure nitrogen, medical compressed air and medical vacuum systems.

"**Plumbing**" is that craft involved in installing, altering, repairing and renovating potable water systems, liquid waste systems and medical gas piping systems within a building. The installation of water softening or water treatment equipment into a water system is not considered plumbing.

"**Specialty plumber**" is anyone who has been issued a specialty plumbers certificate of competency by the department. Specialty plumber certificates are limited to the installation, maintenance and repair of plumbing for single-family dwellings, duplexes and apartment buildings which do not exceed three stories.

"**Supervision**" for the purpose of these rules means within sight or sound. Supervision requirements are met when the supervising plumber is on the premises and within sight or sound of the individual who is being trained.

"**Training course provider**" is an entity approved by the department, in consultation with the state advisory board of plumbers, to provide medical gas piping installer training. All training course providers must comply with the requirements in WAC 296-400A-026.

"**Trainee plumber**" is anyone who has been issued a trainee certificate and is learning or being trained in the plumbing trade with direct supervision of either a journeyman plumber or specialty plumber working in their specialty.

[Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-005, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-005, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-020 How do I obtain a certificate of competency? You can obtain a certificate of competency by completing the following requirements:

(1) Submitting a competency examination application to the department; and

(2) Paying the examination fee shown in WAC 296-400A-045; and

(3) Submitting the required evidence of competency and experience to the department; and

(4) Passing the competency examination.

[Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-020, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-021 How do I obtain a medical gas piping installer endorsement? (Only journeyman plumbers holding active state of Washington certification may apply for this endorsement.)

You can obtain a medical gas piping installer endorsement by completing the following requirements:

(1) Submit an application to the department; and

(2) Pay the examination application fee shown in WAC 296-400A-045; and

(3) Submit the required evidence of approved training to the department; and

(4) Pass the written and practical competency examination;* and

(5) Pay the endorsement issuance fee shown in WAC 296-400A-045 to the department.

At the effective date of these medical gas piping installer rules, if you hold a current medical gas piping installers certificate issued by a department recognized training provider you may apply for the state of Washington medical gas piping installer endorsement in lieu of taking the medical gas piping installer examination. This opportunity to obtain your endorsement without taking the examination will expire one year from the effective date of these medical gas piping installer rules.

*The written and practical competency examination is performed under contract with a nationally recognized testing agency. The results of the competency examination will be forwarded to the department for processing.

[Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-021, filed 6/17/98, effective 7/20/98.]

WAC 296-400A-025 Who approves medical gas piping installer endorsement training courses? RCW 18.106.050 authorizes the department to:

(1) Approve training courses for the medical gas piping installer endorsement; and

(2) Set training course fees.

[Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-025, filed 6/17/98, effective 7/20/98.]

WAC 296-400A-026 What training course approval procedures will the department follow? (1) The department will review and approve courses submitted by training course providers that offer medical gas piping systems training. Course approvals will be decided in consultation with the state advisory board of plumbers.

(2) All providers seeking course approval, must submit the required information (see subsection (5) of this section) to the department at least thirty days before a regularly scheduled advisory board meeting. **No course can be offered as**

meeting the requirements of a medical gas endorsement until it has been approved.

(3) All material required for approval will be reviewed without testimony and the review will be based solely upon the information submitted. Once reviewed, the department has five working days to give a provider written notification of acceptance or rejection. In the case of rejection, the department must specify its reasons.

(4) If a provider has a course rejected, it may request a hearing before the advisory board at the next regularly scheduled meeting. Any information supporting the provider's position, which was not included with the original approval request, must be submitted to the board at least twenty days before the meeting at which the hearing will be held.

At the hearing, the department and the provider may produce witnesses and give testimony. The hearing must be conducted according to chapter 34.05 RCW. The board must base its decision upon the testimony and evidence presented and must notify the parties immediately upon reaching its decision. A majority of the board is necessary to render a decision.

(5) Specific course approval criteria:

(a) All training courses must conform to and be based upon current standards and requirements governing the installation of medical gas piping systems.

(b) All course approval requests must include:

(i) A general description of the course, including its scope, the instructional materials to be used and the instructional methods to be followed; and

(ii) A copy of the complete medical gas piping installer training curriculum; and

(iii) A detailed course outline; and

(iv) The name and qualifications of the course instructor(s); and

(v) The locations where the course will be taught; and

(vi) The days and hours the course will be offered; and

(vii) The specific fees associated with the course, as well as, the total cost of the course.

(c) All fees for approved training courses must be reasonable and in line with fees charged for other comparable code based training courses.

(6) Training courses are approved for a three-year period.

(7) A provider, whose courses are approved, must give the department literature describing the courses so the department can disseminate this information to prospective applicants.

(8) It is the responsibility of the provider to annually review and update its courses and to notify the department of any changes.

(9) The department may withdraw its approval of any training course if it determines the provider is no longer in compliance with the requirements of this chapter. If the department withdraws its approval of a training course, it must give the provider written notification of the withdrawal, specifying the reasons for its decision. If the department withdraws its approval of a training course, the provider may request a hearing before the advisory board at the next regularly scheduled meeting. Any information supporting the provider's position must be submitted to the board at least twenty

days before the meeting at which the hearing will be held. At the hearing, the department and the provider may produce witnesses and give testimony. The hearing must be conducted according to chapter 34.05 RCW. The board must base its decision upon the testimony and evidence presented and must notify the parties immediately upon reaching its decision. A majority of the board is necessary to render a decision.

[Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-026, filed 6/17/98, effective 7/20/98.]

WAC 296-400A-027 Where can I obtain information regarding department approved training course providers? The department will produce a list of all approved training course providers and/or course contact persons. This list will be available to all applicants who request it. It will also be available at all department service locations.

[Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-027, filed 6/17/98, effective 7/20/98.]

WAC 296-400A-030 Do I need a temporary permit?

If you are an active out-of-state journeyman plumber residing in a state that does not have a reciprocal agreement with Washington and you would like to work as a plumber in Washington, you need a temporary permit. Temporary permits are not issued for installers of medical gas piping systems.

[Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-030, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-030, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-031 How do I qualify for a temporary permit? To qualify for a temporary permit, you must:

(1) Have an active state-issued journeyman plumbers certificate; and

(2) Give the department sufficient qualifying evidence for a journeyman plumber certificate of competency; and

(3) Never have taken the journeyman competency examination in Washington state; and

(4) Not be an apprentice plumber.

[Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-031, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-031, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-032 How do I obtain a temporary permit? If you qualify, you can obtain a temporary permit by applying to the department and paying both the examination application fee and the temporary permit fee shown in WAC 296-400A-045.

[Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-032, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-033 What is the duration of a temporary permit? A temporary permit is valid for ninety days and is nonrenewable.

[Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-033, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-035 How can I be placed on inactive status? To be placed on inactive status, you must meet these three requirements:

- (1) Be a currently certified plumber; and
- (2) Be at least sixty-two years of age; and
- (3) Not be working in the plumbing trade.

Inactive status means that you are not currently working in the plumbing trade and you are not required to pay the

annual certificate renewal fee. You may return to active status, without reexamination, by paying the reinstatement of a journeyman certificate fee shown in WAC 296-400A-045.

[Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-035, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-035, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-045 What fees will I have to pay? The following are the department's plumbers fees:

<u>Type of Fee</u>	<u>Period Covered by Fee</u>	<u>Dollar Amount of Fee</u>
Examination application	Per examination	\$ 108.25
Reciprocity application	Per application	\$ 108.25
Trainee certificate*	One year	\$ 32.50
Trainee certificate	Less than one year	\$3.00 per month with a minimum fee of \$21.50
Temporary permit	90 days	\$ 54.25
Journeyman or specialty certificate**	Two years	\$ 87.00
Journeyman or specialty certificate	Less than two years	\$3.50 per month with a minimum fee of \$32.75
Medical gas endorsement examination application***	Per application	\$40.00
Medical gas endorsement**	One year	\$30.00
Medical gas endorsement	Less than one year	\$2.50 per month with a minimum fee of \$17.50
Medical gas endorsement examination fee***		See note below.
Medical gas endorsement training course fee****		See note below.
Reinstatement of a journeyman certificate		\$ 174.00
Replacement of all certificates		\$ 32.50

* The trainee certificate shall expire one year from the date of issuance and be renewed on or before the date of expiration.

** This fee applies to either the original issuance or a renewal of a certificate. If you have passed the plumbers certificate of competency examination or the medical gas piping installer endorsement examination and paid the certificate fee, you will be issued a plumber certificate of competency or a medical gas endorsement that will expire on your birthdate.

The annual renewal of a Medical Gas Piping Installer Endorsement shall include a continuity affidavit verifying that brazing work has been performed within the past year.

*** This fee is paid directly to a nationally recognized testing agency under contract with the department. It covers the cost of preparing and administering the written competency examination and the materials necessary to conduct the practical competency examination required for the medical gas piping system installers endorsement. **This fee is not paid to the department.**

**** This fee is paid directly to a training course provider approved by the department, in consultation with the state advisory board of plumbers. It covers the cost of providing training courses required for the medical gas piping system installer endorsement. **This fee is not paid to the department.**

If your birth year is:

- (1) In an even-numbered year, your certificate will expire on your birthdate in the next even-numbered year.
- (2) In an odd-numbered year, your certificate will expire on your birthdate in the next odd-numbered year.

[Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-045, filed 6/17/98, effective 7/20/98. Statutory Authority: Chapters 18.106, 18.27 and 43.22 RCW. 98-12-041, § 296-400A-045, filed 5/29/98, effective 6/30/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-045, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-050 When does the advisory board of plumbers meet? The advisory board of plumbers meets every quarter on the third Tuesday of January, April, July and October.

[Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-050, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-070 Can I work as a certified plumber in Washington without taking the Washington state plumbers competency examination? You may be eligible to work in Washington state without taking an examination if:

- (1) You have a current plumbers certificate or license from another state; and
- (2) That state has a current reciprocal agreement with the department of labor and industries; and
- (3) You pay the reciprocity application fee and journeyman or specialty certificate fee shown in WAC 296-400A-045.

The director of labor and industries negotiates reciprocal agreements with states that have equivalent requirements for certification and licensing of journeyman and specialty plumbers. The agreement allows plumbers from those states to work in Washington and Washington-certified plumbers to work in the other state without taking competency examinations. To find out if your state has an agreement with the department, contact the plumber's certification clerk at the department's Tumwater, WA headquarters.

Reciprocity agreements cannot be used to take the Washington state competency examination instead of the examination in your home state.

[Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-070, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-070, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-100 For certification purposes, how are "years of employment" computed and documented?

(1) For certification purposes, 2,000 hours of employment is considered one year. See RCW 18.106.070(2).

(2) When you renew your certificate, you must document your previous years' plumbing work by accurately completing the department's approved form and submitting it to the department.

(3) If you have completed a one, two, three, four or more years plumbing construction trainee program, you must have the necessary training hours for the year in which you are registered. See RCW 18.106.040.

[Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-100, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-110 Does previous work experience count toward my trainee certificate? If your work experience was in plumbing construction, you will be given credit for all verifiable hours that are properly submitted on the department's approved form. Plumber trainee hours accumulated in the state of Washington will be credited only if an active Washington state trainee card was in place when the work occurred. (Refer to the definition of "plumbing" in WAC 296-400A-005.)

[Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-110, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-110, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-120 What do I need to know about plumber trainee certificates? (1) The department issues separate trainee certificates according to the following schedule:

Certificate Year	Hours Employed As Plumber Trainee
First	Less than 2,000 hours
Second	More than 1,999 hours but less than 4,000 hours
Third	More than 3,999 hours but less than 6,000 hours
Fourth	More than 5,999 hours

(2) You may apply for the next year's trainee certificate whenever you have the required documented work hours.

(3) You cannot be issued a training certificate for more than eight years unless the department determines that there are extenuating circumstances.

(4) If you are a trainee applying for a journeyman certificate, you must complete a minimum of two of the required four years in commercial plumbing experience.

(5) A certified specialty plumber working on a commercial job site may work as a journeyman trainee only if they

have a current trainee certificate on their person while performing commercial plumbing work.

(6) On a job site, the ratio of certified plumbers to non-certified plumbers must be:

(a) One specialty plumber or journeyman working on a specialty plumbing job may supervise no more than two trainees.

(b) One journeyman plumber working on a commercial job may supervise no more than one trainee.

(7) A plumber trainee who has a current trainee certificate with the state of Washington and has successfully completed or is enrolled in an approved medical gas piping installer training course may work on medical gas piping systems. Work may only occur when there is direct supervision by an active Washington state certified journeyman plumber with an active medical gas piping installer endorsement issued by the department. Supervision must be one hundred percent of the working day on a one-to-one ratio.

[Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-120, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-120, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-121 What do I need to know about trainee experience and plumber examination requirements? (1) If you possess a trainee certificate:

(a) You may take the specialty plumber examination after completing 6,000 hours of documented training.

(b) You may take the journeyman examination after completing 8,000 hours of documented training which must include 4,000 hours of commercial plumbing experience.

(2) All journeyman trainees must work under the direct supervision of a journeyman plumber until they have completed 7,500 hours of training. After completing the 7,500 supervised hours, a trainee may work without direct supervision until they complete 8,000 hours. (See RCW 18.106.070(3).)

When 8,000 training hours have been completed, the trainee must take the journeyman examination. Any trainee who has failed the journeyman plumber examination cannot retake the examination for at least one month and must work under the direct supervision of a journeyman plumber until the examination is passed.

(3) To be eligible for the specialty plumber's examination, a specialty trainee must complete 6,000 hours of training under the direct supervision of either a certified specialty plumber or a journeyman plumber. Any specialty trainee who has failed the specialty examination, cannot retake the examination for at least one month and must work under the direct supervision of a certified plumber until the examination is passed.

(4) **Any applicant** (trainee, specialty plumber or journeyman) who fails an examination, will be required to wait at least one month before retaking the examination. If an applicant fails the second attempt, the waiting period for reexamination will be extended to at least two months. An applicant who fails the examination a third time will have a mandatory waiting period of at least four months.

[Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-121, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-130 What if I make a false statement or a material misrepresentation on an application, an employment report or a trainee certificate? (1) All required applications and annual statements of employment hours are made under oath. Making false statements and/or material misrepresentations carry serious consequences. Any person who knowingly makes a false statement or material misrepresentation on an application, an affidavit of experience or a trainee certificate may be referred to the county prosecutor for criminal prosecution. In addition, the department may subtract a maximum of 2,000 employment hours from a trainee's acceptable total hours.

(2) The department's decisions, under this section, can be appealed to the advisory board. The appeal hearing will be conducted according to the appropriate provisions of chapter 34.05 RCW.

[Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-130, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-140 How does the department enforce plumbers certification requirements? The department enforces plumber certification requirements by means of job-site inspections conducted by department compliance inspectors. The inspector must determine whether:

- (1) Each person doing plumbing work has a proper certificate on their person; and
- (2) The ratio of certified specialty and/or journeyman plumbers to certified trainees is correct; and
- (3) That each certified trainee is directly supervised by either a certified specialty plumber or a certified journeyman; and
- (4) That persons who are installing medical gas piping systems have active medical gas piping installer endorsements in addition to their active plumber certification.

[Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-140, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-140, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-300 What procedures does the department follow when issuing a notice of infraction? (1) If a compliance inspector determines that an individual has violated plumber certification requirements, including medical gas piping installer endorsement requirements, the department must issue a notice of infraction describing the reasons for the infraction.

(2) For plumber certification violations, the department may issue a notice of infraction to either:

- (a) An individual who is plumbing without a current plumber certificate; or
- (b) The employer of the individual who is plumbing without a current plumber certificate; or
- (c) The employer's authorizing agent or foreman that made the work assignment to the individual who is plumbing without a current plumber certificate.

(3) For medical gas piping installer endorsement violations, the department may issue a notice of infraction to either:

(a) An individual who is installing medical gas piping systems without a current plumber certificate and a current medical gas piping installer endorsement; or

(b) The employer of the individual who is installing medical gas piping systems without a current plumber certificate and a current medical gas piping installer endorsement; or

(c) The employer's authorizing agent or foreman that made the work assignment to the individual who is installing medical gas piping systems without a current plumber certificate and a current medical gas piping installer endorsement.

(4) An individual may appeal a notice of infraction by complying with the appropriate provisions of RCW 18.106.220.

(5) If good cause is shown, an administrative law judge may waive, reduce or suspend any monetary penalties resulting from the infraction.

(6) Any monetary penalties collected under this chapter, must be deposited in the plumbing certificate fund.

[Statutory Authority: Chapter 18.106 RCW. 98-13-126, § 296-400A-300, filed 6/17/98, effective 7/20/98. Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-300, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-400 What are the monetary penalties for violating certification requirements? (1) A person cited for an infraction under RCW 18.106.020 (3)(a), (b) or (c) must be assessed a monetary penalty based upon the following schedule:

First Infraction	\$250.00
Second Infraction	\$500.00
Third Infraction	\$750.00
Fourth Infraction	Not more than \$1,000.00

(2) Each day a person is in violation must be considered a separate infraction.

(3) Each job site at which a person is in violation must be considered a separate infraction.

[Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-400, filed 5/20/97, effective 6/30/97.]

WAC 296-400A-425 What if I owe outstanding penalties related to a department issued plumber infraction? The department may deny renewal of your certificate of competency if you owe outstanding penalties. The department must notify you of their denial by registered mail, return receipt requested. This notice of denial will be mailed to the address on your application.

Upon receipt of the notice, you have twenty days to file a notice of appeal with the department. Your notice of appeal must be accompanied by a certified check for two hundred dollars. This amount will be returned to you if the department's decision is not upheld by the hearings officer. If the hearings officer upholds the department's decision, the two hundred dollars must be applied to the cost of the hearing.

The office of administrative hearings shall conduct the hearing under chapter 34.05 RCW.

[Statutory Authority: RCW 18.106.050, [18.106.]070, [18.106.]110, [18.106.]125, [18.106.]140 and [18.106.]270. 97-11-052, § 296-400A-425, filed 5/20/97, effective 6/30/97.]

Chapter 296-401A WAC
CERTIFICATION OF COMPETENCY FOR
JOURNEYMAN ELECTRICIANS

WAC**JOURNEYMAN AND SPECIALTY ELECTRICIANS CERTIFICATES**

296-401A-100	Certificate of competency required.
296-401A-105	Original journeyman and specialty electrician certificates of competency.
296-401A-110	Renewal of journeyman or specialty electrician certificates of competency.
296-401A-120	Late renewal of journeyman and specialty electrician certificates of competency.
296-401A-130	Inactive status.
296-401A-140	Electrical specialties.
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296-401A-160	Revocation of certificate of competency.

QUALIFYING FOR JOURNEYMAN AND SPECIALTY ELECTRICIAN EXAMS

296-401A-200	Qualifying for the journeyman electrician competency examination.
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296-401A-220	U.S. military experience.
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JOURNEYMAN AND SPECIALTY ELECTRICIAN EXAM CONTENTS

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TEMPORARY PERMITS

296-401A-400	Qualifying for a temporary permit to work in Washington when certified in another state.
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RECIPROCAL AGREEMENTS

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TRAINING CERTIFICATES

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296-401A-510	Computation of training hours.
296-401A-520	Training certificate levels.
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296-401A-530	Trainees working without supervision.
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CONTINUING EDUCATION COURSE APPROVAL

296-401A-600	Training course approval.
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FEES

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ENFORCEMENT

296-401A-800	Enforcement.
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APPEAL RIGHTS AND HEARINGS

296-401A-900	Appeal rights.
296-401A-910	Types of appeal hearings.
296-401A-920	Requesting an informal hearing.
296-401A-930	Requesting a formal hearing.
296-401A-935	Hearing deposits.

JOURNEYMAN AND SPECIALTY ELECTRICIANS
CERTIFICATES

WAC 296-401A-100 Certificate of competency required. Who can work in the electrical construction trade?

Those who can work in the electrical construction trade are persons who:

- (1) Possess a current journeyman electrician certificate of competency issued by the department; or
- (2) Possess a current specialty electrician certificate of competency issued by the department; or
- (3) Possess a valid temporary permit; or
- (4) Possess a current electrical trainee certificate and are enrolled in an electrician's apprenticeship program approved under chapter 49.04 RCW, and are learning the trade under the supervision of a certified journeyman; or
- (5) Possess a current electrical trainee certificate and are learning the trade under the supervision of a certified journeyman electrician or certified specialty electrician working in their specialty.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-100, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-105 Original journeyman and specialty electrician certificates of competency. How do I obtain an original journeyman or specialty electrician certificate of competency?

(1) The department of labor and industries will issue an original electrician certificate of competency to journeyman or specialty electricians who:

(a) Meet the eligibility requirements listed in RCW 19.28.530, Certificate of competency—Eligibility for examination—Rules; and

(b) Successfully pass a certification examination required by RCW 19.28.540, Examination—Contents—Times—Fees—Certification of results; and

(c) Pay the original certificate fee listed in WAC 296-401A-700.

(2) Your initial electrician certificate of competency will expire on your birthdate at least one year, and not more than three years, from the date of original issue. All subsequent certificates shall be issued for a three-year period. The department will prorate the certificate fee according to the number of months or major part of a month in a certificate period.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-105, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-110 Renewal of journeyman or specialty electrician certificates of competency. How do I renew my journeyman or specialty electrician certificate of competency?

(1) You must apply for renewal of your journeyman or specialty electrician certificate of competency **before** the expiration date on your certificate. Renewed certificates are valid for three years.

(2) Beginning April 30, 1997, you must pay the renewal fee listed in WAC 296-401A-700, and provide evidence to the department that you have completed at least eight hours of approved continuing education required for each year of

your prior certification period. Any portion of a year is equal to one year for continuing education requirements.

(3) When renewing your certificate, you will not be given credit for the exact same continuing education course taken more than once in the three years prior to your renewal date.

(4) If you are applying to renew a certificate that covered a period of two years or more, you must complete an approved continuing education class, of at least eight hours duration, on the latest National Electric Code changes.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-110, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-120 Late renewal of journeyman and specialty electrician certificates of competency. *May I renew my certificate of competency after the expiration date without reexamination?*

(1) You may renew your electrician certificate within ninety days after the expiration date without reexamination if you pay the late renewal fee listed in WAC 296-401A-700 and provide evidence to the department that you have completed at least eight hours of continuing education each year during the prior certification period.

(2) All applications for renewal received more than ninety days after the expiration date of the certificate require that you pass a competency examination before being recertified.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-120, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-130 Inactive status. *Can I renew my certificate of competency if I have less than the required hours of continuing education per year of my prior certification period?*

If you have not completed the required hours of continuing education, you may apply for renewal before your certificate expires and pay the appropriate renewal fee listed in WAC 296-401A-700. Your renewal certificate will be placed in an inactive status. When your certificate of competency is placed in inactive status, you cannot work as a journeyman or specialty electrician in the electrical construction trade until you provide evidence that you have completed the required hours of continuing education.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-130, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-140 Electrical specialties. *Can I obtain a certificate of competency for an electrical specialty?*

The department issues specialty electricians' certificates of competency in the following areas of electrical work:

(1) **Residential certificate (02):** This certificate limits you to wiring one-family and two-family dwellings, or multi-family dwellings that do not exceed three floors above grade. All residential wiring, except service and feeder wiring, must be nonmetallic sheathed cable. **This certificate does not allow you to wire commercial occupancies such as motels, hotels, offices or stores.**

(2) **Pump and irrigation certificate (03):** This certificate limits you to wiring the electrical connection of domestic water pumps, irrigation pumps, circular irrigating systems and related pumps and pump houses. With this certificate,

you may also install the circuits, feeders, controls and services necessary to supply electricity to the pumps.

(3) **Domestic well specialty electrical technician certificate (03A):** This certificate limits you to the installation of materials, wires and equipment providing electrical power, control and operation of domestic water pumping systems. In addition, you are limited to the extension of a branch circuit (which has been supplied and installed by others) to pump controllers, pressure switches, alarm sensors, and water pumps which do not exceed 7 and 1/2 horsepower at 230 volts AC single phase.

Prior to December 1, 1998, you will be eligible to take the domestic well specialty electrician's competency examination if you provide the department with notarized verification of at least four years prior experience installing domestic water systems, including pump installations, under the supervision of a firm engaged in the business of installing domestic water systems.

After December 1, 1998, you will be eligible to take the domestic well specialty electrician's competency examination **only if** you provide the department with notarized verification of two years experience installing domestic pump systems working under the direct supervision of a domestic well specialty technician, a pump and irrigation specialty electrician or a journeyman electrician.

Certification of domestic well specialty electrical technicians shall be according to the provisions of WAC 296-401A-105 (original certification) and WAC 296-401A-110 (renewal of certification).

(4) **Signs and outline lighting certificate (04):** This certificate limits you to placing signs and outline lighting and connecting them to their electrical supply, controls and related circuit extensions. You are further limited to the installation of a maximum 60 ampere, 120/240 volt, single phase service supplying power to a remote sign.

(5) **Domestic appliance certificate (05):** This certificate limits you to electrically connecting and wiring domestic appliances such as hot water heaters, ranges, dishwashers, clothes dryers, oil and gas furnaces and similar appliances. You may also install the circuits to those domestic appliances. However, **you may not** install service or feeder wires or circuits to electrical furnaces and heat pump equipment.

(6) **Limited energy system certificate (06):** This certificate limits you to installing signaling circuits, power limited circuits and related equipment. Examples of such equipment would be fire protection signaling systems, intrusion alarms, nonutility owned communication systems and similar low energy circuits and equipment.

(7) **Nonresidential maintenance certificate (07):** This certificate limits you to maintaining, repairing and replacing electrical equipment and conductors on industrial or commercial premises. **You may not** conduct maintenance activities in hotels, motels or dwelling units.

(8) **Nonresidential lighting maintenance and lighting retrofit technician (07A):** This certificate limits you to working within the housing of existing nonresidential lighting fixtures and limits you to work related to repair, service, maintenance of lighting fixtures and the installation of energy efficiency upgrades. Your work may include the replacement of lamps, ballasts, sockets and the installation of listed light-

ing retrofit reflectors and kits. Your work must be limited to the fixture body, however, you may replace or retrofit remote located ballasts with approved products. **You may not** install new fixtures or branch circuits, move or relocate existing fixtures, or alter existing branch circuits.

To qualify for this certificate **on or before June 30, 1999**, you must provide proof to the department that you performed electrical lighting maintenance and lighting retrofit installations and you were employed for a minimum of two years by a contractor engaged full-time in the business of nonresidential lighting maintenance and lighting retrofit work. **After June 30, 1999**, all applicants for this certificate must have a minimum of two years full-time experience under the direct supervision of a nonresidential lighting maintenance and retrofit technician; or a nonresidential maintenance specialty electrician; or a journeyman electrician.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-140, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-150 Linemen. *Do I need a certificate of competency if I'm a lineman?*

(1) Electrical linemen employed by a serving electrical utility or employed by a licensed electrical contractor while performing work found in WAC 296-46-935, do not need certificates of competency.

(2) You are eligible for the above lineman's exemption if you carry evidence on your person that you:

(a) Have graduated from a department of labor and industries approved lineman's apprenticeship course; **or**

(b) Are currently registered in a department of labor and industries approved lineman's apprenticeship course **and** are working under the direct supervision of a journeyman electrician or a graduate of a lineman's apprenticeship course approved by the department.

(3) The training you received in the lineman's apprenticeship courses must include training in applicable articles of the currently adopted edition of the National Electrical Code as determined by the department.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-150, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-160 Revocation of certificate of competency. *Can my certificate of competency be revoked?*

(1) The department may revoke any certificate of competency if:

(a) The certificate was obtained through error or fraud; **or**

(b) The certificate holder is judged to be incompetent to work in the electrical construction trade as a journeyman electrician or specialty electrician; **or**

(c) The holder has violated any of the provisions of RCW 19.28.510 through 19.28.620 or any rule adopted under chapter 19.28 RCW.

(2) Before any certificate of competency is revoked, you will be given written notice of the department's intention to do so. Notification will be sent by registered mail to your last known address.

The notification will list the allegations against you, and give you the opportunity to request a hearing before the electrical board. The board will conduct the hearing in accor-

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dance with chapter 34.05 RCW, The Administrative Procedure Act. At the hearing you may produce witnesses and give testimony. The board will render its decision based upon the testimony and evidence presented in the hearing, and will notify you immediately upon reaching its decision.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-160, filed 5/29/98, effective 6/30/98.]

QUALIFYING FOR JOURNEYMAN AND SPECIALTY ELECTRICIAN EXAMS

WAC 296-401A-200 Qualifying for the journeyman electrician competency examination. *How do I qualify to take the journeyman electrician competency examination?*

You may take the journeyman electrician competency examination if you held a current electrical training certificate while you have:

(1) Been employed, in the electrical construction trade, under the direct supervision of a journeyman electrician for four years (8,000 hours) of which two years must be in industrial or commercial electrical installation and not more than a total of two years in all specialties; **or**

(2) Completed a four-year apprenticeship program in the electrical construction trade that is registered with the state apprenticeship council or the Federal Bureau of Apprenticeship and Training; **or**

(3) Have two years of schooling under the conditions listed in RCW 19.28.530, Certificate of competency—Eligibility for examination—Rules, and two years of work experience in industrial or commercial electrical installations under the direct supervision of a journeyman electrician.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-200, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-210 Qualifying the specialty electrician competency examination. *How do I qualify to take the specialty electrician competency examination?*

You may take the specialty electrician competency examination if you held a current electrical training certificate while you have:

(1) Been employed under the direct supervision of a journeyman electrician or an appropriate specialty electrician for a minimum of two years (4,000 hours); **or**

(2) Completed a two-year apprenticeship program in the electrical construction trade that is registered with the state apprenticeship council or the Federal Bureau of Apprenticeship and Training in the appropriate specialty.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-210, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-220 U.S. military experience. *Can I use my U.S. military service experience to qualify for the journeyman or specialty electrician competency examination?*

(1) Anyone who has worked a minimum of four years in the electrical construction trade while serving in the Armed Forces of the United States may be eligible to take the examination for the certificate of competency as a journeyman electrician.

(2) If you have two or more years training or experience in a specialized electrical field in the Armed Forces of the

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United States that is similar to, but not identical to, a specialty electrician category listed in WAC 296-401A-140 you will be eligible for one year credit toward a specialty certificate. You must also work one additional nonmilitary year in the appropriate specialty under the direct supervision of a journeyman or specialty electrician to qualify for the specialty electrician's competency examination.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-220, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-230 Experience in another country.

Can I use my journeyman experience in another country to qualify for the competency examination?

(1) If you have a journeyman electrician certificate from a country outside of the United States that requires at least four years of training, you will be eligible for two years credit toward a journeyman certificate.

(2) You must also take two additional years training in the United States under the direct supervision of a journeyman electrician to qualify for the journeyman's competency examination.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-230, filed 5/29/98, effective 6/30/98.]

JOURNEYMAN AND SPECIALTY ELECTRICIAN EXAM CONTENTS

WAC 296-401A-300 Subjects included in the journeyman electrician competency examinations. *What will be included in the examination for journeyman electrician certificates of competency?*

The following subjects are among those that may be included in the examination for a certificate of competency. The list is not exclusive, and the examination may also contain subjects not on the list.

For journeyman electricians:

AC - Generator; three-phase; meters; characteristics of; power in AC circuits (power factor); mathematics of AC circuits.

Air conditioning - Basic.

Blueprints - Surveys and plot plans; floor plans; service and feeders; electrical symbols; elevation views; plan views.

Building wire - Sizes.

Cable trays.

Calculations.

Capacitive reactance.

Capacitor - Types; in series and parallel.

Circuits - Series; parallel; combination; basic; branch; outside branch circuits; calculations.

Conductor - Voltage drop (line loss); grounded.

Conduit - Wiring methods.

DC - Generator; motors; construction of motors; meters.

Definitions.

Electrical units.

Electron theory.

Fastening devices.

Fire alarms - Introduction to; initiating circuits.

Fuses.

Generation - Principles of.

Grounding.

Incandescent lights.

Inductance - Introduction to; reactance.

Insulation - Of wire.

Mathematics - Square root; vectors; figuring percentages.

Motors - Motors vs. generators/CEMF; single phase; capacitor; repulsion; shaded pole; basic principles of AC motors.

Ohms Law.

Power.

Power factor - AC circuits; correction of; problems.

Rectifiers.

Resistance - Of wire.

Rigging.

Safety - Electrical shock.

Services.

Three-wire system.

Tools.

Transformers - Principles of; types; single phase; three-phase connections.

Voltage polarity across a load.

Wiring methods - Conduit; general.

Wiring systems - Less than 600 volts; 480/277 volts; three-phase delta or wye; distribution systems over 600 volts.

Note: Journeyman electrician examinations may also include the subjects listed below for specialty electrician examinations.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-300, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-310 Subjects included in the specialty electrician competency examination. *What will be included in the examination for specialty electrician certificates of competency?*

The following subjects are among those that may be included in the examination for a certificate of competency. The list is not exclusive, and the examination may also contain subjects not on the list.

For specialty electricians:

AC - Meters.

Appliance circuits or controls.

Blueprints - Floor plans; service and feeders.

Cables - Wiring methods.

Calculations.

Circuits - Series; parallel; combination; basic; outside branch.

Conductor - Voltage drop (line loss); grounded; aluminum or copper.

Conduit - Wiring methods.

Electrical signs, circuits, controls, or services.

Electrical units.

First aid.

Fuses.

General lighting.

Grounding of conductors.

Insulation of wire.

Ladder safety.

Limited energy circuits or systems.

Maintenance of electrical systems.

Mathematics - Figuring percentage.

Motor circuits, controls, feeders, or services.
 Ohm's Law.
 Overcurrent protection.
 Resistance of wire.
 Services.
 Sizes of building wire.
 Three-wire system.
 Tools.
 Transformer - Ratios; single-phase.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-310, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-320 Failure of a competency examination. *What do I do if I fail a competency examination?*

(1) Anyone failing a competency examination may retake the examination by paying the retesting fee listed in WAC 296-401A-700.

(2) Trainees may continue to work in the electrical trade if they have a valid electrical training certificate and work under the direct supervision of a certified journeyman or specialty electrician.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-320, filed 5/29/98, effective 6/30/98.]

TEMPORARY PERMITS

WAC 296-401A-400 Qualifying for a temporary permit to work in Washington when certified in another state. *Can I work as an electrician in Washington if I'm certified in another state?*

(1) If you are certified in another state, the department can issue you one temporary permit in lieu of a certificate of competency if you are coming into Washington state to work in the electrical construction trade. Your temporary permit allows you to work as an electrician during the period of time between filing an application to take the **next** certification examination and the date you receive your examination results.

(2) To qualify for a temporary permit you must:

(a) Meet the eligibility requirements of RCW 19.28.530 (Certificate of Competency—Eligibility for examination—Rules); **and**

(b) Be currently certified by a governing authority from another state, city, town or other certifying authority; **and**

(c) File an application to take the next certification examination.

(3) If you do not take the competency examination, your temporary permit will expire on the date listed on your permit.

(4) If you fail the examination, the department will issue you a second **final** temporary permit only if you enroll in an approved journeyman electrician refresher course and provide the department with evidence that you have not missed any classes. (The life of this second temporary permit cannot exceed ninety days.) Upon completion of the refresher course, you are eligible to retake the competency examination at the next scheduled time.

(5) If you fail the examination after completing an approved journeyman electrician refresher course, your temporary permit is invalid. Therefore, to continue to work in the

electrical trade, you must apply for and receive a training certificate and work under the direct supervision of either a certified journeyman or a specialty electrician working in their specialty.

(6) You will not be issued a temporary permit if you:

(a) Failed the examination on your first attempt and did not enroll in an approved journeyman electrician refresher course; or

(b) Did not furnish the department with the evidence required under RCW 19.28.520 when you applied to take the examination; or

(c) Are an apprentice electrician.

(7) You will be issued a certificate of competency only if you pass the competency examination.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-400, filed 5/29/98, effective 6/30/98.]

RECIPROCAL AGREEMENTS

WAC 296-401A-410 Reciprocal agreements between Washington and other states. *What are reciprocal agreements and how are they used?*

The department of labor and industries negotiates agreements with states that have equivalent requirements for certification and licensing of journeyman or specialty electricians. The agreements allow electricians from those states to become certified in Washington state without examination and Washington-certified electricians to become certified in the other states without taking competency examinations. To find out if your state has a reciprocal agreement with the department, contact the electrical section of your local department of labor and industries office.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-410, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-420 Qualifying for reciprocal electrician certificate. *How do I qualify for a reciprocal electrician certificate?*

The department will issue a reciprocal electrician certificate of competency to you if you are coming into the state of Washington from another state and the following conditions are met:

(1) The department has a valid reciprocal agreement with the other state in the journeyman or specialty category requested; **and**

(2) You apply for the reciprocity certificate on the form provided by the department; **and**

(3) You provide evidence that you meet the eligibility requirements listed in RCW 19.28.530, Certificate of competency—Eligibility for examination—Rules; **and**

(4) You obtained a certificate of competency as a journeyman or specialty electrician in the other state **while you resided there; and**

(5) You pay the reciprocity fee listed in WAC 296-401A-700.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-420, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-430 Ineligibility for reciprocal electrician certificate. *Who is not eligible for a reciprocal electrician certificate?*

You are **not** eligible for a reciprocal electrician certificate if you:

- (1) Do not meet the eligibility requirements listed in WAC 296-401A-420; **or**
- (2) Have taken and failed a Washington state electrician competency examination; **or**
- (3) Have failed to renew a certificate of competency as required in RCW 19.28.550(1), Certificate of competency—Issuance—Renewal—Continuing education—Fees—Effect.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-430, filed 5/29/98, effective 6/30/98.]

TRAINING CERTIFICATES

WAC 296-401A-500 Renewal of training certificates. *How do I document my training hours to renew my training certificate?*

- (1) When you renew your electrical training certificate, you must give the department an **accurate** list of the employers you worked for in the electrical trade during the previous year. The list must include the employer's name, the electrical category you worked in, and the number of hours worked in each category for every employer.
- (2) You should ask each employer or apprenticeship program director for an accurate list of the hours you worked in the previous year. The employers must provide the list to you within twenty days of your request.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-500, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-510 Computation of training hours. *How are training employment hours computed?*

- (1) Two thousand (2,000) hours is equal to one year of employment.
- (2) If you have completed a four year electrical apprenticeship program that is registered with the state apprenticeship council or the Federal Bureau of Apprenticeship and Training, you will be credited with 8,000 hours (four years) of employment.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-510, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-520 Training certificate levels. *Am I qualified for a higher level of training certificate?*

Training Certificate	Total Hours Worked
1st year	0 through 2,000
2nd year	2,001 through 4,000
3rd year	4,001 through 6,000
4th year	6,001 or more

You may apply for the next year's certificate whenever you have worked sufficient hours.

Note: The department will verify the hours submitted with your training certificate application.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-520, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-524 Credit for electrical work experience exempt from certification requirements. *Can I receive credit for electrical work experience which is exempt from the certification requirements in RCW 19.28.610 Exemptions from RCW 19.28.510 through 19.28.620?*

- (1) To receive credit for electrical work experience which is exempt from RCW 19.28.610, you must provide the department with verification from the employer or owner for whom the electrical work was performed.
- (2) **Beginning January 1, 1998**, all exempt individuals learning the electrical trade must obtain from the department an electrical certificate and renew it annually in order to receive credit for hours worked in the trade according to WAC 296-401A-500.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-524, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-530 Trainees working without supervision. *Can I work as a trainee without supervision?*

- You will be issued a six-month, nonrenewable unsupervised electrical training certificate that will allow you to work without supervision if you:
- (1) Apply for an unsupervised electrical training certificate; **and**
 - (2) Have worked over 7,000 hours; **and**
 - (3) Have successfully completed or are currently enrolled in an approved apprenticeship program or an electrical construction trade program in a school approved by the board of community and technical colleges; **and**
 - (4) Pay the fee listed in WAC 296-401A-700.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-530, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-540 Who will not be issued training certificates? Electricians certified in other states who are eligible for temporary or reciprocal certificates will not be issued training certificates.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-540, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-545 Audit of trainee hours. *Does the department audit my trainee hours?*

- (1) The department, based upon RCW 19.28.515, Electrical trainee hours—Audit—Rules—Confidentiality, may audit the employment records of the electrical contractor or employer who verified your electrical trainee hours. The time period covered by an audit may be less than one year but will not exceed five years from the date each affidavit verifying your trainee hours is submitted.
- (2) Every employer or contractor must keep a record of your employment as a trainee so the department may obtain the information it needs to verify your electrical trainee work experience. Upon the request of the department's auditors or agents, these records must be made available to the department for inspection within seven business days.
- (3) Your employer or contractor must maintain time cards or similar records to verify the number of hours you worked as a supervised trainee and the type of electrical work you performed.

(4) Any information obtained from your contractor or employer during the audit under the provisions of RCW

19.28.515 is confidential and is not open to public inspection under chapter 42.17 RCW.

(5) The department's audit may include but will not be limited to the following:

(a) An audit to determine whether you were employed by the contractor or employer during the period for which your hours were submitted, the actual number of hours you worked and the category of electrical work you performed.

(b) An audit covering a specific time period and examining a contractor's or employer's books and records which may include their reporting of your payroll hours required for industrial insurance, employment security or prevailing wage purposes.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-545, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-550 Penalties for false statements or material misrepresentations. *What may happen if a person makes a false statement on an application or annual statement of hours worked?*

A person who knowingly makes a false statement or material misrepresentation on an application, statement of hours, or signed statement required by the department may be referred to the county prosecutor for criminal prosecution under RCW 9A.72.020, 9A.72.030, and 9A.72.040. The department may also file a civil action under RCW 19.28.620 and may subtract up to 900 hours of employment from a trainee's total hours, if the department determines the trainee has made a false statement or material misrepresentation.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-550, filed 5/29/98, effective 6/30/98.]

CONTINUING EDUCATION COURSE APPROVAL

WAC 296-401A-600 Training course approval. *How are decisions to approve continuing education courses made?*

(1) Each continuing education class, course, or seminar for renewal of an electrician's certificate of competency must be approved by a three-member subcommittee of the electrical board. The chief electrical inspector will be an ex-officio member of this subcommittee.

(2) All applications for approval must be on forms provided by the department, and will be reviewed without testimony. The board will *only* consider information you submit with the application for approval of the continuing education training.

(3) To be considered for approval, continuing education courses must consist of not less than four classroom hours of instruction, and be open to monitoring by a representative of the department and/or the electrical board at no charge.

(4) Approved courses must be based on:

(a) Currently adopted edition of the National Electrical Code; and/or

(b) Currently adopted administrative rules (chapters 296-46 and 296-401A WAC); or

(c) Materials and methods as they pertain to electrical construction, building management systems, electrical maintenance and workplace health and safety.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-600, filed 5/29/98, effective 6/30/98.]

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WAC 296-401A-610 Offering continuing education courses. *What happens after the subcommittee approves or disapproves my application for continuing education course approval?*

You will be notified of the subcommittee's decision within five days of the review of your application.

- **If your continuing education class, course, or seminar is approved**, you may offer the training for up to three years without additional approval. If a new edition of the National Electrical Code is adopted within the three-year period, you must resubmit an application for approval of any code-related class, course, or seminar.
- **If your application is not approved**, the notice will include an explanation of the reasons for rejection. If you disagree with the subcommittee's decision, you may request a reconsideration hearing by the electrical board. Your request must be received by the board forty-five days before a regularly scheduled board meeting. All additional information you want considered must be submitted not less than thirty days before the board hearing.

Note: Continuing education class, course, or seminar hours completed before approval by the subcommittee cannot be used to meet the electrician's certificate requirements.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-610, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-620 Application for continuing education course approval. *What information must a continuing education sponsor provide to have a continuing education course approved?*

(1) The department of labor and industries will provide continuing education approval forms to sponsors upon request. The original completed application for training approval, plus three copies, must be received by the department at least forty-five days before the proposed first class, course, or seminar is offered.

(2) Information on the **application** must include:

(a) Course title, number of classroom instruction hours, and whether the training is open to the public.

(b) Sponsor's name, address, and contact's name and phone number.

(c) Course outline (general description of the training, including specific Electrical Code articles referenced).

(d) Lists of resources (texts, references, visual aids).

(e) Names and qualifications of instructors.

(f) Any additional documentation you want considered.

(g) A copy of the completion certificate or the department's continuing education form that will be used to document:

(i) Each participant's name, address, birthdate, and Social Security number; and

(ii) The course number, location, and date of training; and

(iii) The instructor's name and signature or notarized signature of sponsor.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-620, filed 5/29/98, effective 6/30/98.]

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WAC 296-401A-630 Documentation of training course completion. *How is completion of the training course documented?*

(1) Sponsors must award a certificate or continuing education form to each participant completing the class, course, or seminar. The participants will submit a copy of the certificate or form to the department when they apply for renewal of their electrician's certificates. The department will only accept a copy of the sponsor's certificate or form as evidence that the participant completed the training course.

(2) Following the completion of each approved continuing education, the course sponsors must submit, to the department, a copy of the original attendance sign-in sheet containing the signatures of all class participants. Sponsors offering approved correspondence courses must submit, to the department, a roster of all class participants who successfully complete the course.

(3) The department will not keep submitted copies of the continuing education certificates or forms on file after renewal of the electrician's certificate. We will not accept, nor be responsible for, the original of any completion certificate issued.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-630, filed 5/29/98, effective 6/30/98.]

FEES

WAC 296-401A-700 Fees for certificates of competency, examination and reciprocity. *How much do I pay for a journeyman, specialty, or training certificate, competency examination, or reciprocity?*

When you apply to take a competency examination or to obtain a certificate of competency, you must pay the appropriate fee listed below.

Type of Certificate	Fee
(1) Journeyman or specialty electrician certificate renewal (per 36-month period)	\$ 64.50
(2) Late renewal of journeyman or specialty electrician certificate (per 36-month period)	\$ 130.00
(3) Journeyman or specialty electrician examination application (nonrefundable)	\$ 27.00
(4) Journeyman or specialty electrician original certificate	\$ 42.50
(5) Training certificate (expires one year after purchase)	\$ 20.75
(6) Training certificate renewal or update of hours	\$ 20.75
(7) Unsupervised electrical training certificate	\$ 20.75
(8) Journeyman or specialty electrician test or retest	\$ 48.75
(9) Reciprocal journeyman or specialty certificate	\$ 69.50
(10) Reinstatement of journeyman or specialty certificate	\$ 20.75
(11) Continuing education course submittal and approval, per course	\$ 41.50
(12) Continuing education course renewal, per course	\$ 20.75
(13) Refund processing fee	\$ 10.50
All requests for refunds will be assessed a processing fee	\$ 10.50

Note: Failure to appear for an examination results in forfeiture of the examination fee.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-700, filed 5/29/98, effective 6/30/98.]

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ENFORCEMENT

WAC 296-401A-800 Enforcement. *How do compliance officers and electrical inspectors determine compliance at a job site?*

(1) The department of labor and industries ensures that employers and employees comply with the requirements of chapter 19.28 RCW, Electricians and Electrical Installations, and chapter 296-401A WAC, Certification of Competency for Journeyman Electricians, by inspecting electrical job sites. To do this, inspections are made by the department's compliance officers or electrical inspectors.

(2) The compliance officers or electrical inspectors determine whether:

(a) Each person doing electrical work on the job site has a proper journeyman, specialty, or training certificate; **and**

(b) The ratio of certified journeyman electricians to the certified trainees on the job site is correct; **and**

(c) Each certified trainee is directly supervised by an individual with a journeyman or proper specialty certificate of competency for the type of electrical work being performed.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-800, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-810 Failure to comply with electrician certification law. *What happens if an employer or employee is not complying with the electrician certification laws at the time of inspection?*

(1) If the compliance officer or electrical inspector determines that an employer or employee has violated chapter 19.28 RCW, Electricians and Electrical Installations, or chapter 296-401A WAC, Certification of Competency for Journeyman Electricians, the department will issue a citation that describes the reason for the violation. A cease and desist order may be issued by the compliance officer or electrical inspector if the employer or employee continues to violate the law.

(2) Employers and employees may appeal the citation or cease and desist order by requesting a hearing (see RCW 19.28.620, Violations of RCW 19.28.510 through 19.28.620—Schedule of penalties—Appeal). A request for hearing, however, does not stay the effect of the citation or cease and desist order.

(3) If the employer or employee disobeys the cease and desist order, the department shall apply to superior court for a court order enforcing the cease and desist order. If the employer or employee disobeys the court order, the department shall request the attorney general to apply to the superior court for an order holding the employer or employee in contempt of court.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-810, filed 5/29/98, effective 6/30/98.]

APPEAL RIGHTS AND HEARINGS

WAC 296-401A-900 Appeal rights. *Can I request a hearing or appeal a decision of the department?*

You may request a formal or informal hearing before the electrical board within twenty days of receipt of any:

- Citation.

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- Cease and desist order.
- Suspension or revocation of a training, journeyman, or specialty electrician certificate of competency.
- Denial of an application to take an examination, or reduction of hours as allowed in WAC 296-401A-550.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-900, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-910 Types of appeal hearings. What is the difference between a formal and an informal appeal?

The following table summarizes the differences between a formal and an informal hearing:

Type of Hearing	Hearing Held by	Deposit Required	Results
Informal	Electrical Board	None	Informal Decision
Formal	Administrative Law Judge	\$200.00	Findings of Fact, Conclusions of Law, and Proposed Decision and Order, subject to final acceptance or rejection by the Electrical Board

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-910, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-920 Requesting an informal hearing. How do I request an informal hearing?

You may request an informal hearing by the electrical board by writing a letter to the department chief electrical inspector stating the action taken by the department that you wish to appeal. Your letter should also state what you want the department to do as a result of the hearing.

Note: For additional information about appeals before the electrical board, see chapter 296-13 WAC.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-920, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-930 Requesting a formal hearing. How do I request a formal hearing?

(1) Write a letter to the department's chief electrical inspector stating the action taken by the department that is being appealed. Also state what you want the department to do as a result of the hearing; **and**

(2) Enclose a certified check in the amount of two hundred dollars made payable to the department of labor and industries.

Note: Formal appeals are conducted as required in the Administrative Procedure Act, chapter 34.05 RCW.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-930, filed 5/29/98, effective 6/30/98.]

WAC 296-401A-935 Hearing deposits. What happens to my formal hearing deposit?

(1) Your deposit will be returned to you if the decision of the department is not sustained or upheld.

(2) If the decision of the department is sustained or upheld, your deposit will be used to pay the expenses of holding the hearing. Any balance remaining after payment of the hearing expenses will be paid into the electrical license fund.

[Statutory Authority: Chapter 19.28 RCW. 98-12-042, § 296-401A-935, filed 5/29/98, effective 6/30/98.]

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**Chapter 296-402 WAC
ELECTRICAL TESTING LABORATORY
ACCREDITATION**

WAC

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WAC 296-402-010 Foreword. This chapter is promulgated in accordance with the provisions of chapter 19.28 RCW which covers electricians and electrical installations.

To qualify for certification as an approved electrical products testing laboratory, the criteria of this chapter shall be complied with.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070. 85-20-130 (Order 85-27), § 296-402-010, filed 10/2/85.]

WAC 296-402-020 Purpose and scope. The purpose of this chapter is to provide for recognition and accreditation of electrical products testing and certification laboratories for the state of Washington so the general consuming public can be assured that electrical products have been tested for safety and identified for their intended use.

Any electrical product, device, system, material, or installation which is accepted, or classified, identified, or certified, or listed, or labeled by a Washington state accredited electrical products testing laboratory shall be deemed to have been successfully evaluated for safety.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070. 85-20-130 (Order 85-27), § 296-402-020, filed 10/2/85.]

WAC 296-402-030 Definitions. The definitions set forth in this section shall apply throughout this chapter.

(1) "ANSI" means American National Standards Institute.

(2) "Board" means the electrical board established pursuant to RCW 19.28.065. The term "board" also includes an administrative law judge or board member appointed by the board to hear an appeal.

(3) "Certified electrical product" means an electrical product that is certified under this chapter:

(a) To which a label, symbol, or other identifying mark of an approved testing laboratory has been attached to indicate that the manufacturer produced the product in compliance with appropriate standards or that the product performs in a specified manner.

(b) That is not decertified.

(4) "Certification mark" means a specified approved testing laboratory identification indicating that a certified electrical product has been manufactured in accordance with the requirements of appropriate standards or tested for specific end uses.

(5) "Certification program" means a specified set of testing, inspection, and quality assurance procedures, with appropriate implementing authority directed toward evaluating products for certification of compliance to the requirements of appropriate standards.

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

(7) "Electrical board" means the board established pursuant to RCW 19.28.065. The term "electrical board" also includes an administrative law judge or board member appointed by the board to hear an appeal.

(8) "Labeled" means an electrical product to which a label, symbol, or other identifying mark of an approved laboratory is attached.

(9) "Laboratory operations control manual" means a document consisting of specified procedures and information for each test method responding to the application requirements of the product standard.

(10) "Quality control manual" means a document consisting of general guidelines for the quality control of the laboratory's method of operation. Specific information is provided for portions of individual test methods whenever specifics are needed to comply with the criteria or otherwise support the laboratory's operations.

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-402-030, filed 7/21/88. Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-030, filed 10/2/85.]

WAC 296-402-040 Organization. The laboratory shall be an independent, third-party testing and inspection organization with no organizational, managerial, or financial affiliation with manufacturers, suppliers, or vendors of products covered under its certification programs.

(1) The laboratory shall not be owned by manufacturers or vendors.

(2) The laboratory administration shall not be controlled by manufacturers or vendors.

(3) The laboratory shall be legally constituted and permitted to perform certification work.

(4) The laboratory shall not be engaged in the promotion or design of the product being evaluated, tested, or certified.

(5) The laboratory shall have sufficient diversity of clients or activity so that the loss or award of a specific contract regarding certification would not be a determinative factor in the financial well-being of the laboratory.

(6) The employment security status of the personnel of the laboratory shall be free of influence or control of manufacturers or vendors of products certified.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-040, filed 10/2/85.]

WAC 296-402-050 Professional and ethical business practices. The laboratory shall be operated in accordance with generally accepted professional and ethical business

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practices and shall agree in writing that as a minimum it will be its policy to:

(1) Perform the examinations, tests, evaluations, and inspections required under the certification programs in accordance with the designated standards and procedures.

(2) Assure that reported values accurately reflect measured data.

(3) Limit work to that for which competence and capacity are available.

(4) Treat test data, records, and reports as proprietary information.

(5) Respond and attempt to resolve complaints contesting test results and certifications.

(6) Be capable of performing all examinations, tests, evaluations, and inspections for certification programs for which it is approved according to the latest effective version of applicable safety standards as adopted by rule, and require that all certified products produced after the effective date comply with such standards.

(7) Maintain an independent relationship between its clients, affiliates, or other organizations, so that the laboratory's capacity to render test reports and certifications objectively and without bias is not adversely affected.

(8) Notify the department within thirty calendar days should it become unable to conform to any of these criteria.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-050, filed 10/2/85.]

WAC 296-402-060 Quality control system. The laboratory shall maintain a quality control system to help assure the accuracy and technical integrity of its work as follows:

(1) The laboratory's quality control system must include a quality control manual or a laboratory operations control manual containing written procedures and information in response to the applicable requirements of the product standard. The procedures and information may be explicitly contained in the manual or may be referenced so that their location in the laboratory is clearly identified. The written procedures and information must be adequate to guide a testing technician and inspector in conducting the tests and inspections in accordance with the test methods and procedures required for the certification programs for which accreditation is sought.

(2) The laboratory shall have a current copy of its quality control manual available in the laboratory for use by laboratory personnel and shall make the manual available to the department for review and audit.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-060, filed 10/2/85.]

WAC 296-402-070 Personnel. The laboratory shall be staffed by competent personnel who shall have the necessary education, training, technical knowledge, and experience for their assigned functions to perform the tests, examinations, reevaluations, and inspections for certification programs for which accreditation is sought.

(1) There shall be a job description for each senior technical position category.

(2) The laboratory shall assure the competency of its staff through the observation and/or examination of each rel-

evant staff member in the performance of tests, examinations, and inspections that each member is assigned to perform. The observations must be conducted at intervals not exceeding one year by one or more individuals judged qualified by the person who has technical responsibility for the operation.

(3) The laboratory shall make available the description of its training program for assuring that new or untrained staff will be able to perform tests and inspections properly and uniformly to the requisite degree of precision and accuracy.

(4) The laboratory shall maintain records, including dates of the observation or examination of performance of personnel. Information on the relevant qualifications, training, and experience of the technical staff shall be maintained by the laboratory and shall be furnished to the department on request.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-070, filed 10/2/85.]

WAC 296-402-080 Calibration—Verification and maintenance of facilities and equipment. The laboratory shall provide evidence of the calibration, verification, and maintenance of the facilities and equipment specified for each test method for certification programs for which accreditation is sought by means of the following:

(1) A description of the procedures used in calibrating, verifying, and maintaining the test equipment and facilities, including as applicable:

- (a) Calibration and verification equipment or services used;
- (b) Reference standards and materials used;
- (c) Measurement assurance, corroborative reference, or other programs in which the laboratory participates; and
- (d) Specified maintenance practices.

(2) Calibration and verification records, including as applicable:

- (a) Equipment description or name;
- (b) Name of manufacturer;
- (c) Model, style, and serial number, or other identification;
- (d) Equipment variables subject to calibration and verification;
- (e) Statement of the instrument's allowable error and tolerances of readings;
- (f) Calibration or verification schedule (intervals);
- (g) Dates and results of last calibrations or verifications and schedule of future calibrations or verifications;
- (h) Name of laboratory person or outside contractor providing the calibration or verification services; and
- (i) Traceability to National Bureau of Standards or other standard reference authority as required.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-080, filed 10/2/85.]

WAC 296-402-090 Plans for certification programs. The laboratory shall maintain plans for its certification programs for which accreditation is sought which shall include, as applicable, instructions for:

- (1) Equipment maintenance and verification checks.
- (2) Sample selection.
- (3) Data collection, analysis, and reporting.

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(4) Quality control checks and audits.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-090, filed 10/2/85.]

WAC 296-402-100 Records. The laboratory shall maintain records and prepare reports of those testing, inspection, and certification activities associated with each program for which approval is sought. The laboratory shall make available to the department, upon request, a typical completed test or inspection report with the name of the client and source of any product deleted. Test and inspection reports shall contain, as applicable:

- (1) Name and address of the laboratory.
- (2) Pertinent data and identification of tests or inspections.
- (3) Name of client.
- (4) Description and identification of the sample including, as necessary, where and how the sample was selected.
- (5) An appropriate title.
- (6) Identification of the test, inspection, or procedure as specified for the certification program.
- (7) Known deviations, additions to, or exclusions from testing, inspection, and certification activities in order to be appropriate to new or innovative products not contemplated by the standard.
- (8) Measurements, examinations, derived results, and identification of test anomalies.
- (9) If necessary, a statement as to whether or not the results comply with the requirements of the standard.
- (10) Signature of person(s) having responsibility for the report.
- (11) Data generated during testing if not included in the test report, such as raw data, calculations, tables, graphs, sketches, and photographs, shall be maintained.
- (12) Sample control forms documenting the receipt, handling, storage, shipping, and testing of samples or a written description of the procedures and separate records that are maintained to control these operations.
- (13) The laboratory shall have copies of applicable standards and other documents referred to or used in performing each test or inspection for product certification for which approval is sought.
- (14) The laboratory shall maintain records of its quality control checks and audits for monitoring its test work associated with its certification programs, including:
 - (a) Records of products assurance (follow-up) test results; and
 - (b) Records of detected errors and discrepancies and actions taken subsequent to such detection.
- (15) The laboratory shall maintain a record of written complaints and disposition thereof.
- (16) The laboratory shall retain records required by these criteria for a minimum of three years.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-100, filed 10/2/85.]

WAC 296-402-110 Product certification program. (1) General. The testing laboratory shall be approved only to certify those products identified by the laboratory in its application and as authorized by the department. The certification

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program shall contain the procedures and authority to ensure that the certified product complies with the standards (requirements) established by the program.

(2) Electrical product safety standard used. The standard used as the basis of the certification program shall be a state approved product safety standard that is determined to provide an adequate level of safety or define an adequate level of safety performance.

(a) Generally, such standards shall:

(i) Be recognized in the United States as an electrical product safety standard.

(ii) Be compatible with and be maintained current with periodic revisions of applicable national codes and installation standards.

(iii) Be developed by a standards developing organization under a method providing for input and consideration of views of industry groups, experts, users, consumers, and governmental authorities, and others having broad experience in the electrical products safety field.

(b) All ANSI safety designated electrical product standards are deemed acceptable without further qualification.

(c) If a testing laboratory desires to use a published standard other than an ANSI standard, the department shall evaluate the proposed standard to determine that it provides an adequate level of safety. If there exists an ANSI standard, or other published standard meeting the criteria of (a) of this subsection which has been recognized by the department for use in certification programs, the laboratory shall identify and justify all differences between the proposed standard and such ANSI standard or other standard previously recognized by the department.

(d) Where there is no published standard meeting the above cited criteria for the equipment under consideration, the department shall evaluate the proposed standard to determine that it provides an adequate level of safety. The laboratory shall identify and justify the adequacy of the standard or other specifications used as a source of requirements.

(e) The department shall review proposed standards to determine that they provide an adequate level of safety and shall present a recommendation concerning each proposed standard to the electrical advisory board at a regular or special board meeting for the board's approval.

(3) Evaluation of components. Components of certified products shall be evaluated for compliance with standards applicable to such components or found to be suitable for use in the product as stated in the end product standard.

(4) Certification agreement. Measures, such as the following, to provide for manufacturer compliance with the provisions of the product standard and laboratory control of the use of the certification mark shall be embodied in an agreement between the manufacturer and the testing laboratory:

(a) Require the manufacturer to provide such information and assistance as needed by the testing laboratory to conduct the necessary product conformity and production assurance evaluation.

(b) Require the manufacturer to provide the testing laboratory's representative access during working hours to the factory for inspection and audit activities without prior notice.

(c) Restrict the manufacturer to application of certification marks only to products that comply with requirements of the product standard.

(d) Secure the manufacturer's agreement to the publication of notice by the testing laboratory for any product already available in the marketplace that does not meet the safety standard.

(e) Whenever the standard covering the product is revised, require reevaluation of products as a condition of continued use of the certification mark.

(f) Provide for notification by the laboratory of the manufacturer's personnel responsible for and authorized to institute product recall in the case of a hazard.

(g) Provide for control of certification marks (or labels) by the testing laboratory.

(h) Require that the testing laboratory provide to the manufacturer a report of original product evaluation, which documents by test results and other data, when conformity with the applicable product standard is achieved.

(i) Require the manufacturer to provide the identification of the manufacturer or vendor of the product, and, if the product is produced in more than one location, the place of manufacture of the product.

(5) Identification of certified products. Certified products shall be labeled or marked with the certification mark of the approved testing laboratory. The certification mark shall:

(a) Be owned by the testing laboratory and be registered as a certification mark with the United States Patent and Trademark Office.

(b) Not be readily transferable from one product to another.

(c) Be directly applied to each unit of production in the form of labels or markings suitable for the environment and use of the product, except where the physical size of the unit does not permit, in which case markings may then be attached to the smallest package in which the unit is marketed.

(d) Include the name or other appropriate identification of the testing laboratory.

(e) Include the product category where such is not completely obvious.

(6) Directory (list) of certified products. The testing laboratory shall publish annually a products directory to identify products that are authorized to bear the laboratory's certification mark (label). The products directory shall briefly describe the program, the products covered, the name of the manufacturer or vendor of the certified products, and the identification of the published standards or the compiled requirements on which the program is based. The products directory shall be available to the public. Supplemental up-to-date information shall be publicly available at the office of the testing laboratory at any time during normal business hours.

(7) Original conformance (engineering) evaluation. Prior to authorizing the use of a certification mark on a product, the testing laboratory shall:

(a) Determine by examination and/or tests that representative samples of the product comply with the requirements (standards). Components of certified products shall also be required to comply with the safety standards (requirements)

applicable to such components or found to be suitable for use as stated in the end product standard. Evaluation of the product design shall be made on representative production samples or on prototype product samples with subsequent verification that factory productions are the same as the prototype.

(b) Determine that the manufacturer has the necessary facilities, test equipment, and control procedures to ensure that continuing production of the product complies with the requirements.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070. 85-20-130 (Order 85-27), § 296-402-110, filed 10/2/85.]

WAC 296-402-120 Product assurance (follow-up) activities. (1) General. Concurrent with and subsequent to authorizing the manufacturer to use the testing laboratory's certification mark, the testing laboratory shall establish a factory follow-up inspection program to determine continued compliance of certified products with the applicable standard.

(2) Follow-up inspection manual. The testing laboratory shall prepare and utilize an inspection manual setting forth the conditions governing the use of the certification mark on the products. The inspection manual shall include the identification of the products authorized for certification; identification of manufacturer and plant location at which manufacture and certification are authorized; description, specifications, and requirements applicable to the product; description of processes where needed for control purposes; description of the manufacturer's quality assurance program when used as part of the follow-up program; description of inspections and tests to be conducted by the manufacturer and the inspector; description of countercheck tests to be conducted in the laboratory; and description of the form and means of applying the certification mark.

(3) Follow-up procedures and activities. Follow-up procedures and activities shall include the following:

(a) Periodic unannounced inspections at the factory with testing at the factory or testing laboratory of representative samples selected from production and, if appropriate, from the market.

(b) Periodic auditing or surveillance of the manufacturer's quality assurance program through the witnessing of manufacturer's tests, review of the manufacturer's records, and verification of the manufacturer's produced data.

(c) Investigation of alleged field failures upon department request.

(d) Procedures for control of the use of the certification mark by:

(i) Keeping records of the release and use of certification marks.

(ii) Removal of marks from noncomplying products.

(iii) Return or destruction of unused marks when the authority to use the marks is terminated.

(iv) Legal action.

(e) Frequency of follow-up. The frequency of follow-up inspections shall be sufficient to provide a reasonable check on the means which the manufacturer exercises to assure that the product bearing the certification mark complies with the applicable standards. The frequency shall not be less than

once each three months, unless adequate data is provided to the department to justify less frequent inspections.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070. 85-20-130 (Order 85-27), § 296-402-120, filed 10/2/85.]

WAC 296-402-130 Laboratory approval program implementation. (1) The department may establish a standing committee for the purpose of recommending action regarding approval of electrical testing laboratories, and reviewing of applications, non-ANSI standards, and other technical criteria.

(2) The department shall develop forms and procedures which will enable applicants to submit the data necessary for evaluation.

(3) The department may waive on-site inspection for a testing laboratory showing evidence of current recognition by another state determined to provide an accreditation program acceptable to the department.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070. 85-20-130 (Order 85-27), § 296-402-130, filed 10/2/85.]

WAC 296-402-140 Initial laboratory evaluation. (1) The department shall:

(a) Accept requests for testing laboratory certification.

(b) Make an administrative review to ensure completeness and accuracy of information.

(c) Review the request.

(d) Arrange for the laboratory on-site inspection by a technically qualified representative of the department to evaluate compliance with accreditation criteria. The cost shall be borne by the applicant.

(2) Notification of evaluation and evaluation results. The department shall notify the applicant of the recommendation of the department and time and place of the hearing to consider the request.

(3) Fees. There shall be an initial filing fee accompanying the application, an initial accreditation fee, and a biennial renewal fee as established from time to time by the department. Evaluation costs including travel expenses and any additional related expenses shall be borne by the laboratory. On-site inspections, requiring fees, shall not be made more than once a year, unless additional inspections are required by the department or requested by the laboratory.

Initial filing fee	\$ 500.00
Initial accreditation fee:	
One product category	\$ 250.00
Each additional category for the next nineteen categories	\$ 100.00 each
Maximum for twenty categories or more	\$ 2150.00
Biennial renewal fee	50% of the amount of the initial accreditation fee

(4) Number and category. Each accredited testing laboratory shall be identified by the number of electrical product category(ies) that the department has determined the laboratory is qualified to evaluate. The accreditation shall indicate

the electrical product category(ies) for which accreditation is issued.

(5) Approval. The department shall accept or deny laboratory approval. Such approval shall be subject to reexamination when deemed necessary by the department.

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-402-140, filed 7/21/88. Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-140, filed 10/2/85.]

WAC 296-402-150 Renewals. At least thirty days prior to the expiration date of any such accreditation, the electrical testing laboratory shall forward to the department an application for renewal. The department, upon receipt of the completed form and fee, shall renew accreditation for a period of two years or notify such applicant of the department's refusal with reasons thereof. Accreditation may be renewed for one or more electrical product category(ies) and renewal may be refused for one or more electrical product category(ies).

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-402-150, filed 7/21/88. Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-150, filed 10/2/85.]

WAC 296-402-160 Conditions of accreditation. (1) Evidence of accreditation. The accreditation of any testing laboratory shall be evidenced by a letter of accreditation from the department.

(2) Period of accreditation. The accreditation of a testing laboratory shall be valid for a period of two years from the date of acceptance by the department. The period of validity shall be stated in the letter of accreditation.

(3) Maintenance of qualifying conditions. Every accredited testing laboratory shall continue to satisfy all the conditions specified in this chapter during the period of the accreditation.

(4) Reports. The accredited laboratory shall furnish the department an annual report detailing the extent of its activities for the year, and covering the products which it has certified during the year. The report shall include information concerning:

- (a) The number of factory inspections.
- (b) List of certified products.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-160, filed 10/2/85.]

WAC 296-402-170 Penalties. Any person and/or laboratory that fails to comply with the requirements of these rules and regulations or that files a false report may have accreditation revoked for one or more electrical product category(ies) and shall bear such cost which may accrue to the department or its agent(s) as a result of the violation. A laboratory whose accreditation has been revoked may apply again for accreditation no sooner than one year after the date of revocation of accreditation.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-170, filed 10/2/85.]

WAC 296-402-180 Notification of change. Testing laboratories accredited under these rules and regulations shall notify the department within thirty working days of any of the following:

- (1) Change in company name and/or address.
- (2) Changes in major test equipment.
- (3) Changes in principal officers, key supervisory and responsible personnel in the company including the director of testing and engineering services, director of follow-up services, and the laboratory supervisor.
- (4) Change in the standard(s) covering the certified product(s).
- (5) Change in independent status.

[Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-180, filed 10/2/85.]

WAC 296-402-190 Revocation and suspension procedures. (1) Revocation and suspension. The department on its own initiative may suspend or revoke the accreditation of any testing laboratory found to be in noncompliance with these rules and regulations, the laws of the state of Washington, or having substantial evidence of the laboratory's conduct in unethical business practices.

(2) Notice and conference. Prior to suspension, revocation, or failure to renew the accreditation of a laboratory, written notice of such intent shall be served by certified mail by the department. Within fifteen calendar days of receipt of such notice, the affected laboratory may request a conference before the department. Should the electrical testing laboratory disagree with the decision of the department, an appeal may be made to the electrical board, as provided for in WAC 296-402-200.

(3) Effect of suspension and revocation. If the accreditation is suspended, revoked, or not renewed, the laboratory shall immediately notify the involved manufacturers whose products are covered by the accreditation that such products manufactured subsequent to the revocation and offered for sale in the state of Washington can no longer bear the laboratory's label that identified it as a certified product.

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-402-190, filed 7/21/88. Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-190, filed 10/2/85.]

WAC 296-402-200 Appeal procedures. (1) An applicant or electrical product testing laboratory that disagrees with the action of the department regarding accreditation, qualification or approval or denial of product categories may appeal to the electrical board. An appeal shall be made in writing to the department chief electrical inspector as secretary to the board within fifteen days of receiving an adverse decision from the department. The written appeal shall state the decision of the department that is being appealed and the relief that is desired.

(2) A request for a formal appeal shall be accompanied by a certified check in the amount of two hundred dollars made payable to the department. The deposit shall be returned to the aggrieved party if the decision of the department is not sustained or upheld. If the decision of the department is sustained or upheld, the deposit shall be used to pay the expenses of holding the hearing and any balance remaining after payment of the hearing expenses shall be paid into the electrical license fund. The formal appeal shall be held in conformance with the requirements of the Administrative Procedure Act, chapter 34.04 RCW, and will be heard at a

regular or special board meeting, at a special hearing date or may be assigned by the board to an administrative law judge.

(3) An informal appeal will be heard by the board at a regular or special board meeting.

(4) See chapter 296-13 WAC for additional information on appeals before the electrical board.

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-402-200, filed 7/21/88.]

Chapter 296-403 WAC AMUSEMENT RIDES OR STRUCTURES

WAC

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WAC 296-403-010 Definitions. (1) "Amusement structure" means any electrical or mechanical devices or combinations thereof operated for revenue and to provide amusement or entertainment to viewers or audiences at carnivals, fairs, or amusement parks. "Amusement structure" does not include games in which a member of the public must perform an act, nor concessions at which customers may make purchases.

(2) "Amusement ride" means any vehicle, boat, or other mechanical device moving upon or within a structure, along cables or rails, through the air by centrifugal force or otherwise, or across water, that is used to convey one or more individuals for amusement, entertainment, diversion, or recreation. "Amusement ride" includes, but is not limited to, devices commonly known as skyrides, ferris wheels, carousels, parachute towers, tunnels of love, and roller coasters. "Amusement ride" shall not include: (a) Conveyances for persons in recreational winter sports activities such as ski lifts, ski tows, j-bars, t-bars, and similar devices subject to regulation under chapter 70.88 RCW; (b) any single-passenger coin-operated ride that is manually, mechanically, or electrically operated and customarily placed in a public location and that does not normally require the supervision or services of an operator; (c) nonmechanized playground equipment, including but not limited to, swings, seesaws, stationary spring-mounted animal features, rider-propelled merry-go-rounds, climbers, slides, trampolines, and physical fitness devices; or (d) water slides.

(3) "Board" means the electrical board established pursuant to RCW 19.28.065. The term "board" also includes an administrative law judge or board member(s) appointed by the board to hear an appeal.

(4) "Electrical board" means the board established pursuant to RCW 19.28.065. The term "electrical board" also

includes an administrative law judge or board member(s) appointed by the board to hear an appeal.

(5) "Department" means the department of labor and industries.

(6) "Insurance policy" means an insurance policy written by an insurer authorized to do business in this state under Title 48 RCW.

(7) "Certificate of inspection" means a document given under oath or affirmation from an insurer or a person with whom the insurer has contracted to make a mechanical safety inspection of the amusement ride or structure. The certificate shall contain the name, address and notarized signature of the inspector, the complete description of the amusement ride or structure and the name and address of the owner or operator.

(8) "Certificate of insurance" means a document certifying that the insurance required by chapter 67.42 RCW is in effect.

(9) "Operating permit" means a permit which is issued by the department.

(10) "Operating permit decal" is a decal issued by the department which shall be affixed on or adjacent to the control panel of the amusement ride or structure in a location visible to the patrons of the ride or structure.

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-403-010, filed 7/21/88. Statutory Authority: Chapter 67.42 RCW, 86-12-019 (Order 86-16), § 296-403-010, filed 5/28/86.]

WAC 296-403-020 Insurance. An original copy of the insurance policy in an amount not less than one million dollars per occurrence from an insurer authorized to do business in the state of Washington shall be filed with the department. The insurance company shall notify the department at least ten days prior to cancelling or revoking a policy and upon the nonrenewal of the policy. A certificate of insurance shall be filed with each sponsor, lessor, landowner, or other person responsible for an amusement ride being offered for use by the public. If the insurance company withdraws, cancels, revokes, suspends, or excludes coverage of any ride(s) from any policy furnished to the department, such withdrawal, cancellation, revocation, suspension, or exclusion shall be plainly stated in documents furnished to the department. The department shall be notified within twenty-four hours of the withdrawal, cancellation, revocation, suspension, or exclusion of insurance coverage of an amusement ride or structure for which an operating permit has been issued by the department.

[Statutory Authority: Chapter 67.42 RCW, 86-12-019 (Order 86-16), § 296-403-020, filed 5/28/86.]

WAC 296-403-030 Application for operating permit. (1) The applicant for an operating permit for an amusement structure or an amusement ride shall provide the following documents on forms approved by the department:

(a) The name, address and phone number of the owner or operator of the amusement ride or structure together with the name and signature of the applicant.

(b) Description of amusement structure or ride. Each amusement structure or ride shall be individually identified: (i) By a trade name or title and a narrative description from which the amusement structure or ride can be identified; and (ii) a serial number which is welded onto the frame or con-

tained on an identification plate which is permanently affixed to the amusement structure or ride.

(c) Certificate of inspection. Each application shall have attached a certificate of inspection which shall certify that the ride or structure has been inspected for safety and meets the standards for insurance coverage. The signature of the inspector shall be notarized.

(d) The proper fee.

(2) Renewal of operating permit. An operating permit may be renewed prior to the expiration date by submitting an application with the proper fee and a certificate of mechanical safety inspection. The mechanical safety inspection shall have been performed within thirty days of the expiration date of the operating permit.

[Statutory Authority: Chapter 67.42 RCW. 86-12-019 (Order 86-16), § 296-403-030, filed 5/28/86.]

WAC 296-403-040 Operating permit. An amusement ride or structure shall not be operated unless the owner or operator has obtained from the department an operating permit and an operating permit decal. The operating permit decal shall be affixed on or adjacent to the control panel of the amusement ride or structure in a location visible to the patrons of the ride or structure. The owner or operator of the amusement ride or structure shall have available for inspection, at the location where the amusement ride or structure is to be operated, a copy of the operating permit for each amusement ride or structure. Each operating permit which has been issued to an owner or operator is valid for one year from the date of issue or the date of inspection whichever is less, unless revoked. The operating permit shall become null and void in the event that the insurance policy is cancelled or is no longer in effect or if an amusement ride or structure is materially rebuilt or materially modified so as to change the original action of the amusement ride or structure.

[Statutory Authority: Chapter 67.42 RCW. 86-12-019 (Order 86-16), § 296-403-040, filed 5/28/86.]

WAC 296-403-050 Temporary operating permit. A temporary operating permit for a period not to exceed fifteen calendar days may be issued by a department electrical inspector who is assured that the insurance policy required by chapter 67.42 RCW is on file with the department, that the safety inspection of the amusement ride or structure has been performed within the last year and that a proper application for an operating permit has been made.

[Statutory Authority: Chapter 67.42 RCW. 86-12-019 (Order 86-16), § 296-403-050, filed 5/28/86.]

WAC 296-403-060 Fees. The fee for issuing each operating permit and operating permit decal shall be ten dollars. All fees shall be deposited by the department in the electrical license fund.

[Statutory Authority: Chapter 67.42 RCW. 86-12-019 (Order 86-16), § 296-403-060, filed 5/28/86.]

WAC 296-403-070 Appeals. (1) A decision by the department in which; an operating permit has been denied or revoked; the department has ordered the cessation of the operation of an amusement ride or structure; an amusement ride inspector application has been denied, or certificate has

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been suspended or revoked, may be appealed to the electrical board. The appeal shall be conducted in accordance with chapter 34.04 RCW. An appeal shall not stay the decision of the department. The appeal shall be filed within fifteen days after notice of the decision of the department is given by certified mail, return receipt requested, or is served upon the owner or operator.

(2) A formal appeal shall be affected by filing a written notice of appeal with the department's chief electrical inspector and shall state the decision by the department that is being appealed and the relief that is desired. The formal appeal shall be accompanied by a certified check for two hundred dollars which shall be returned to the holder of the certificate or permit if the decision of the department is not sustained by the board. If the board sustains the decision of the department, the two hundred dollars shall be applied by the department to the payment of the per diem and expenses of the members of the board incurred in the matter, and any balance remaining after payment of per diem and expenses shall be paid into the electrical license fund.

(3) An informal appeal shall be made in writing to the department chief electrical inspector and shall state the action by the department that is being appealed and the relief that is desired.

(4) See chapter 296-13 WAC for additional information on appeals before the electrical board.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-403-070, filed 7/21/88. Statutory Authority: Chapter 67.42 RCW. 86-12-019 (Order 86-16), § 296-403-070, filed 5/28/86.]

WAC 296-403-080 Amusement ride inspector qualifications. An amusement ride inspector shall have the following minimum qualifications:

(1) Two years experience with an insurance company as an amusement ride inspector; or

(2) Two years experience inspecting amusement rides and enforcing amusement ride codes while employed by a state or governmental body regulating amusement rides; or

(3) Not less than five years documented field operating and maintenance experience with amusement rides and devices, including responsibility for erection, assembly, disassembly; personnel supervision responsibility for erection, maintenance, and operating functions; or

(4) Not less than ten years documented practical experience in the design, construction, maintenance, repair, field inspection, and operation of amusement rides and devices as an authorized representative of a recognized amusement ride manufacturer.

[Statutory Authority: Chapter 67.42 RCW. 86-24-071 (Order 86-16), § 296-403-080, filed 12/3/86.]

WAC 296-403-090 Safety and maintenance seminar. Every inspector shall annually attend at least one amusement ride safety and maintenance seminar sponsored by the American Recreational Equipment Association or an equivalent approved by the department. All experience and schooling shall be documented and verified which shall be furnished to the department with an application for an amusement ride inspector certificate.

[Statutory Authority: Chapter 67.42 RCW. 86-24-071 (Order 86-16), § 296-403-090, filed 12/3/86.]

WAC 296-403-100 On-site examination. All applicants, after payment of fees and after being deemed qualified by experience will be required to pass an on-site inspection of a minimum of at least six rides of which no two may be the same. This on-site inspection will be supervised by the electrical inspection section and each applicant will be evaluated on his general knowledge of the field and specific criteria. If the applicant fails, the applicant may reapply in six months.

[Statutory Authority: Chapter 67.42 RCW. 86-24-071 (Order 86-16), § 296-403-100, filed 12/3/86.]

WAC 296-403-110 On-site examination content. The on-site inspection examination will include, at a minimum, the applicant's familiarity with: Proper blocking; main bearings and bearings or bushings on each passenger container; main drive unit alignment and excess wear; entire ride lubrication and excess lubrication; proper ride R.P.M.; braking surfaces condition and effectiveness; emergency stop procedures; structural defects, broken bolts, cracked welds, etc.; missing and proper size pins and proper keys; guys, anti-sway devices, cable placement and proper tension; bolts (correct grade); alignment; operation at full R.P.M.; operator control during normal operating hours with normal crowds; machinery for proper guards; points of wear for excess wear; manufacturer's maintenance manual for specific rides and manufacturer recommended points of critical inspection; entrance, egress, and public areas for oil, broken boards, hand rails and safety restraints for waiting riders; entrance and exit sharp edges, torn metal, and exposed parts that a passenger could encounter; tubs, chairs, seats, containers, for exposed dangerous edges, safety restraints, condition of safety webbing, latches, hinges, worn parts, proper alignment of bars, doors, latches; rider operated controls; all cars, tubs or chair bushing, suspension, shocks, safety chains, safety cables; car tub or chair worn or loose bushings; exits to determine if exits could be entered or if proper restraints are in place; all electrical boxes locked; all rides have an equipment grounding conductor extending from ride back to main power source; main power properly grounded and fused; insulation on all power cords; proper fusing on branch circuits according to wire size; all splices for bare conductors and proper insulation; all cords on rides for condition, plugs and cord bodies; light fixtures secured; light fixtures for wiring methods; articulated items for wiring deficiencies, slip rings, and such other aspects and conditions as are set out in manufacturers specifications and technical data; requirements under the National Electrical Code or chapter 296-46 WAC for amusement rides and devices; rider or devices which are substantially altered, or for which manufacturer's data is not available.

[Statutory Authority: Chapter 67.42 RCW. 86-24-071 (Order 86-16), § 296-403-110, filed 12/3/86.]

WAC 296-403-120 Reciprocal certificate. The department may upon proper application, issue an amusement ride inspector certificate to an individual who meets the minimum qualifications as set forth in this chapter and who possesses a current, valid amusement ride inspector certificate in a state or province which has equal or higher standards for amusement ride inspectors as those contained in this chapter. No amusement ride inspection examination will be required of

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those persons who qualify for a reciprocal amusement ride inspector certificate.

[Statutory Authority: Chapter 67.42 RCW. 86-24-071 (Order 86-16), § 296-403-120, filed 12/3/86.]

WAC 296-403-130 Insurance company amusement ride inspector. An insurance company amusement ride inspector may inspect only amusement rides or devices insured or to be insured by his or her employer or principle. The amusement ride inspector who is inspecting an amusement ride or device which is, or is to be insured by his or her employer, is exempt from the minimum qualifications and on-site inspection examination of this chapter.

[Statutory Authority: Chapter 67.42 RCW. 86-24-071 (Order 86-16), § 296-403-130, filed 12/3/86.]

WAC 296-403-140 Revocation of certification of amusement ride inspectors—Reinstatement. (1) An amusement ride inspector's certificate of competency may be suspended or revoked for any cause such as certifying the safety of an unsafe ride, falsifying records or reports or certifying an amusement ride or structure which he or she has not personally inspected.

(2) No certificate of competency shall be suspended or revoked until after a hearing has been held before the department. The inspector and his employer are entitled to appear at such hearings and to be heard.

(3) The department of labor and industries shall deliver to both the inspector charged and to his employer, not less than ten days prior to the hearing, a written notice of the charges and of the time and place of such hearing.

(4) An inspector whose certificate of competency has been suspended or revoked may apply for the reinstatement thereof not less than ninety days after the time of revocation.

[Statutory Authority: Chapter 67.42 RCW. 86-24-071 (Order 86-16), § 296-403-140, filed 12/3/86.]

WAC 296-403-150 Fees for examination, certification, and renewal of certification for inspectors. (1) Fee for each application for inspector's certificate of competency and examination \$100

(2) Application fee (nonrefundable) \$ 20

(3) Fee for annual renewal of certificate of competency, reciprocal inspector certificate, or for insurance company inspector certificate \$ 20

[Statutory Authority: Chapter 67.42 RCW. 86-24-071 (Order 86-16), § 296-403-150, filed 12/3/86.]